OCTOBER 1952

American Engineer

RR

IN THIS ISSUE . . .

- **AN ENGINEER'S REPORT ON THE FUTURE**

By Charles F. Kettering,
Vice President, General Motors Corp.

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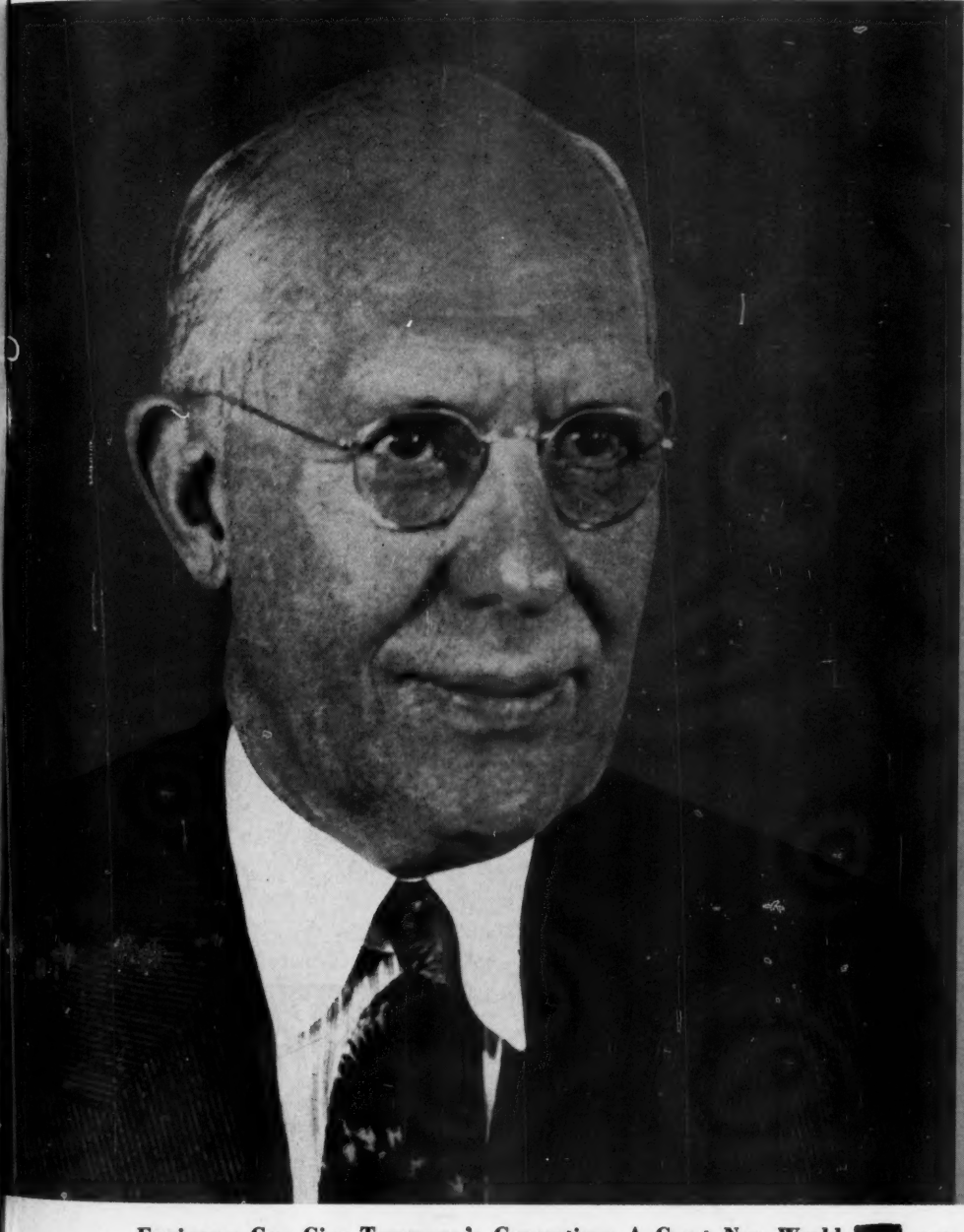

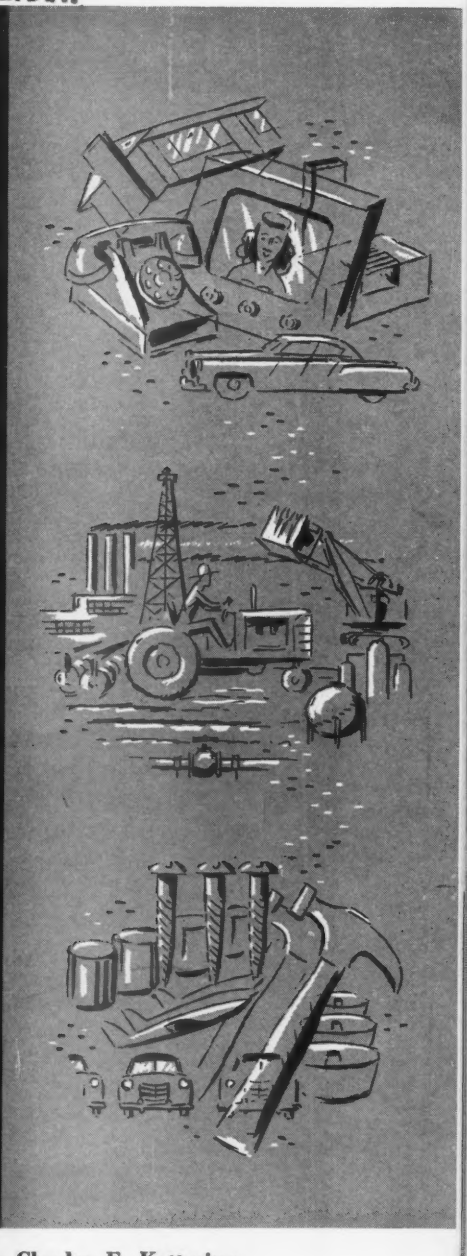

Engineers Can Give Tomorrow's Generations A Great New World [redacted] **says Charles F. Kettering.**

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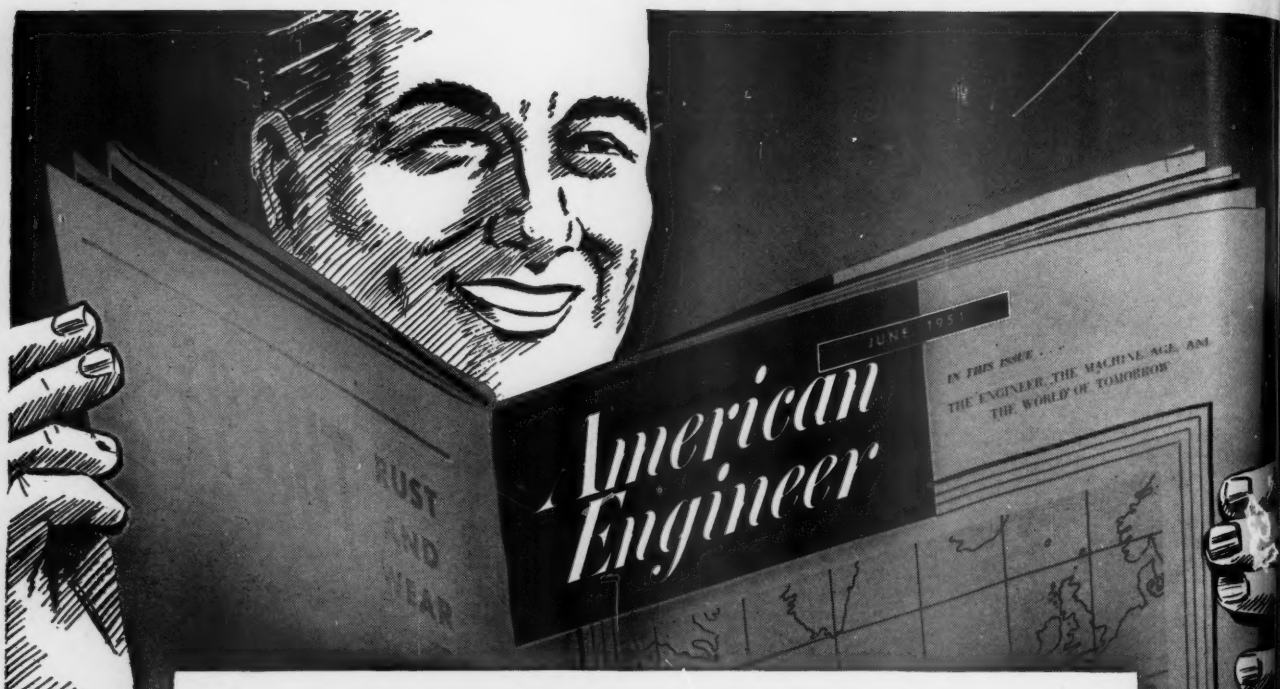

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Letters

J. Edgar Hoover . . .

Dear Editor:

Congratulations on the September issue article by J. Edgar Hoover.

Please send four (4) reprints or duplicates if available.

L. A. ROYCE, P.E.
Portland, Ore.

Nautical Noodles . . .

Dear Editor:

An engineering magazine, above all others, should be very careful to use technical language properly. I refer to page 11 and page 14 of the September issue.

Page 11, twice the words "two knots per hour" are used. A knot is a measure of distance AND time, namely, a *knot is* one nautical mile per hour.

Page 14, the picture caption refers to "a concrete mining plant." Concrete is not mined; it is manufactured.

A. RISHER HALL, JR., P.E.,
Fort Wayne, Ind.

Dear Editor:

Your interesting article "The Submarine—Man's Ancient Fascination" uses the term "knots per hour" under the caption of Robert Fulton's submarine, and also in describing Robert Fulton's accomplishment under the sponsorship of Napoleon. It has always been my understanding that one knot represents one nautical mile per hour, and that the term "knots per hour" is erroneous.

S. R. FRANKEL, P.E.,
Reading, Pa.

► It seems incongruous that the author of the submarine piece, a naval officer during the war, could fail to know all about knots. His defense, however, is that he spent his time handing out pea jackets to boots at the Great Lakes Naval Training Center, and has never been in a boat except on the Central Park lagoon. —*Editor.*

Conveyors . . .

Dear Editor:

The September story about conveyors was interesting, but it is distressing that engineers can become so subjective about an objective consideration.

There is no doubt that conveyors will become even more important in our society, but carrying freight and passengers by conveyor is about as reasonable as making every residential street an expressway.

The quoted statistics on the savings a river to lake conveyor would achieve are pure imagination. The figure given was $1.06 per ton. Since the cost of moving all freight over the B&LE railroad from lake to river in 1949 was 97¢ per ton, including high rated manufactured products, it appears that the conveyor will manufacture money as well as transportation. How can you save $1.06 out of 97¢, when a $200,000,000 investment must be paid off at $10,000,000 per year, plus annual interest of $12,000,000. These debts alone would cost more than the operation of the entire river to lake railroad which carries everything. (Data is from ICC reports.)

The article admits that railroads will be needed anyway, so that even if there were savings, the railroad overhead would remain, to be assessed upon others whose products the belt "common carrier" would not accept. Since train operation is only 25% of the railroads costs after taxes, every dollar lost to the railroads would require a 75¢ higher charge on other shippers.

I think the belt people forgot taxes too. Federal income taxes on the belt operation would be about $6,000,000 per year at a 50-50 debt ratio. Since the belt requires full capacity operation, what will we do for standby facilities? There are too many special interests here to justify consideration by any State legislature.

The passenger belt (Times Square) is in the same economic disrepute. While it will save operating costs, the extra fixed charges will twice consume the saving. No progress here unless money has become worthless, but if that is the case, what are we working for?

E. L. TENNYSON, P.E.,
Youngstown, O.

P. E. . . .

Dear Editor:

In reference to the article on "The 'P. E.' Signature," which appeared in the September, 1952, issue of the AMERICAN ENGINEER, I make the following suggestion:

Professional Engineers in the government service are reluctant to sign communications in the proper manner as put forth in the article referred to above, unless given official authority. It is for this reason I suggest that action be taken by the NSPE to have official word come direct from Washington to all Federal Agencies employing Professional Engineers, (in the form of a memorandum), that Professional Engineers who are in authority to sign business correspon-

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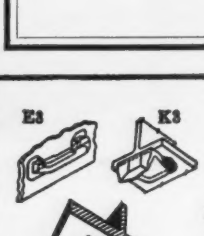

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ence, sign such matter in the proper form. . . .

A PENNSYLVANIA ENGINEER.

▸ The above letter has been referred to the appropriate NSPE committee for study.—*Editor.*

Dear Editor:

. . . I am interested in the article appearing on page 28 of the September issue. I believe another article in the magazine showing examples of how "P.E." should be used in a letterhead along with consulting engineers or civil engineer, etc., and on calling cards, would be of interest to many.

DAVID E. BENTON, P. E.,
Idaho Falls, Idaho

Salary Improvement . .

Dear Editor:

In the "Letters" section of the September issue under "Salary Improvement," Engineer E. G. Van Leeuwen makes some interesting comments regarding the forgotton salaried engineers.

I have watched at close hand an organization such as he suggests may become more attractive to engineers in this group, actually come into being and recently assume a national position. The NSPE has taken a "do nothing" attitude as it has taken before, and will probably regret this later.

Professional and economic status are closely related. They progress together. If the NSPE is going to promote the engineering profession and thus the status of the engineer it will have to forget about segregating employer and employee engineers and work for the welfare of professional engineers as such and also keep in mind that young unlicensed engineers are potential professional engineers.

The NSPE has so far shown a spineless attitude toward the problems of young engineers and employee engineers of any age. This could go on until the NSPE has lost all prestige as a representative of the engineering profession. The younger engineers have already started to go about helping themselves since no one else will help them, thus the above mentioned national organization to represent employee engineers.

It has been my observation that many engineers in management or even minor executive positions add to the woe of the employee engineer. It is alarming to me to note the influx of corporation management into the executive branch of NSPE. I can't suggest a solution to this as those in management are the only ones who can devote the necessary time to the work and not suffer financially. However it will be the exception in this group who will be sympathetic to the problems of the employee engineer. We may soon find ourselves in the same position as the so called "founder societies" which are almost completely run by representatives of management and have little interest in employees except in technical matters.

Since the bulk of our membership is among employees we'd better give this matter some serious consideration followed closely by *action* or we will cease to exist.

E. K. CLIVER, P.E.,
Westfield, N. J.

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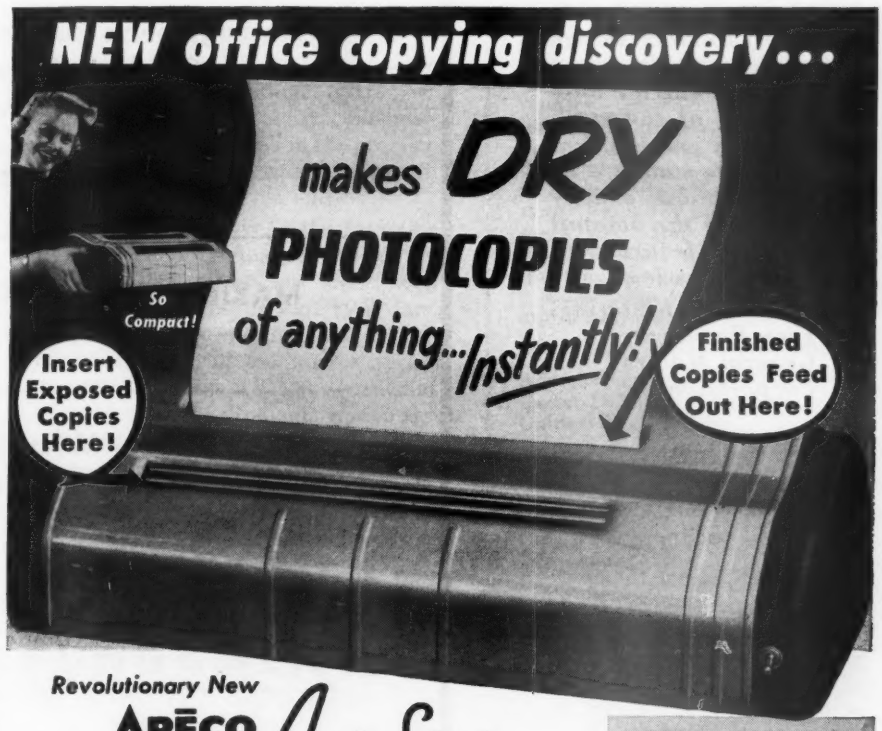

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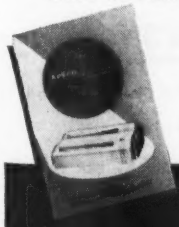

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American Engineer

OCTOBER
1952

"We are the greatest users of power in the world. About 98% of all our effort to move things is mechanical. In some backward countries only about 33% of the work is done by mechanical devices. The standard of living is almost exactly in inverse to the amount of power that is furnished by human muscles."

—Charles F. Kettering, Vice President, General Motors Corporation

Kenneth E. Trombley,
Editor

David A. Heller,
Staff Writer

A. C. Neff, P.E.,
Chairman, Publications
Committee, NSPE

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Court Rules Against Unregistered Engineer

• A Philadelphia, Pa. court has ruled that a person who performed engineering services for a corporation, but who was not registered as a professional engineer under the law of the state, may not maintain a suit to recover for his services. This decision, which was noted by Samuel I. Sacks, P.E., NSPE's legal counsel, is in line with a former Pennsylvania case to the same effect (Howarth *v.* Gilman, reported in AMERICAN ENGINEER, June, 1949; affirmed by the Pennsylvania Supreme Court, AMERICAN ENGINEER, June, 1950).

In the current case, known as A. B. Segur, etc., v. Hastings & Co., Inc., Segur had contracted as an industrial engineer to develop the operation of cutting and booking gold leaf in the plant of the Hastings Company. The county court said the sole issue was whether the services offered to be performed fell within the definition of "practice of engineering" as set forth in the Pennsylvania registration law. The court further found that there was no claim that Segur was registered as an industrial engineer or was exempt from licensure.

After quoting and analyzing the Pennsylvania law definitions of "professional engineer" and "practice of engineering" the court observed that Segur admitted his claim to being an industrial engineer and claimed special knowledge in instructing and guiding the Hastings Company in their work. The court then held that industrial engineering comes within the definitions of the Pennsylvania law and cited the Howarth case in support of this finding.

Further quoting from the Howarth case, the court cited the statement of Chief Justice Drew, "That the courts will not lend their aid to enforcement of unlawful contracts which are founded upon transactions in violation of public policy declared by the legislature is unquestionably true."

The Philadelphia court concluded that Segur was engaged in the practice of industrial engineering contrary to law, and dismissed his suit.

In the Howarth case the Supreme Court of Pennsylvania was passing on the 1927 law which has since been superceded by the present 1945 law. The latter act contains a more explicit definition of engineering practice and the decision is also significant because it is the first one under the 1945 law.

With these two cases on the books it is now clearly established in Pennsylvania that a person performing engineering services who is not registered may not look to the courts for aid in collecting his fee.

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(AE 102)

Professional News in Capsule Form

Yale Holds Centennial • Foreign Engineers in U.S. • Eisenhower and Stevenson Talk About Engineering • Other Items of Interest

Yale University is holding its centennial of engineering instruction this month. In 1852, when Professor William A. Norton of Brown University accepted the University's invitation to become the first full professor of engineering at New Haven, formal undergraduate instruction in the science was begun.

(Earlier in the school's history, at the turn of the 19th century, Yale's President Timothy Dwight, conducted scientific experiments in the new science of electricity.)

Professor Norton's first class was 26 men strong. The demand for engineering knowledge was great and in two years the department merged with the School of Applied Chemistry to form the Yale Scientific School. Finally, in 1932, the School of Engineering with its own dean, became a separate entity.

* * *

Two hundred engineers from foreign countries are in the United States touring the nation's biggest industrial plants. They are here under the auspices of the Mutual Security Agency and various cooperating engineering groups. The group attended the convocation in Chicago marking the 100th anniversary of the American Society of Civil Engineers.

* * *

A manpower policy statement issued recently by Acting Mobilization Director John R. Steelman cited the urgent need to utilize the abilities of engineers and scientists and to attract an increasingly greater number of men and women to these professions.

Noting that only about one per cent of employed civilians are engaged in engineering and biological and physical sciences, Dr. Steelman declared: "On this numerically small but vitally important segment of our manpower depends in very large part our national security and future increases in our standard of living.

"Therefore, the realities of international relations indicate that intensive activity in the fields of engineering, science and industrial development must be made an even more important aspect of our continuing national security."

* * *

The Fifth Annual Illinois Traffic Engineering Conference will be conducted on the campus of the University of Illinois at Urbana on December 11 and 12. The Conference is sponsored by the Department of Civil Engineering at the University in cooperation with the Illinois Division of Highways, the Midwest Section of the Institute of Traffic Engineers, the Illinois Traffic Safety Council, and the Illinois Municipal League.

Inquiries and requests for additional information may be addressed to R. K. Newton, Supervisor, Engineering Extension, 713½ South Wright Street, Champaign, Illinois.

* * *

Engineers are getting some attention from the Republican and Democratic presidential candidates—even though only indirectly in connection with the need for engineers in certain key positions.

General Eisenhower, at a question-and-answer session, when asked if he had any specific program for reduction of military expenditures, replied that he would bring the right kind of qualified people into the picture to find the waste, naming such persons as business men, professional engineers and personnel directors.

Governor Stevenson in his San Francisco foreign policy speech cited the need for engineers, agricultural experts, and other trained personnel in connection with the program of technical assistance to foreign nations.

* * *

Dr. Edward K. Strong, Jr., noted psychologist and professor emeritus of Stanford University, has published a study in a recent issue of the *Journal of Applied Psychology* which indicates that engineers are *born engineers*. Dr. Strong tested 306 Stanford freshmen in 1930. Those who became engineers since scored 99% engineering interest on the Strong Vocational Interest Test. Another group who became physicians scored 48% engineering interest and of those who became lawyers a mere 16% engineering interest was scored.

The test does not indicate a man's ability to do a certain job. It measures how much he will enjoy doing it. Dr. Strong believes that enjoyment of one's job is as important as having the ability to do it.

Professional and scientific men called in the draft are now receiving only half the normal basic infantry training in order to take advantage of their special skills, the Army reports. Engineers, chemists, bacteriologists, entomologists, mathematicians and many other professional students with college degrees in one of the specified sciences will be classified as specialists to make sure none of their skills are lost to the Army under the new procedure.

* * *

The Florida State Board of Engineer Examiners last week heard pro and con evidence on charges of professional malpractice against Laurence G. Farrant, Miami consulting engineer. But it will be several weeks before the board's decision is announced.

The board has power to revoke Farrant's registration or suspend it. In either case, Farrant, under Florida law, has the right of appeal to the courts.

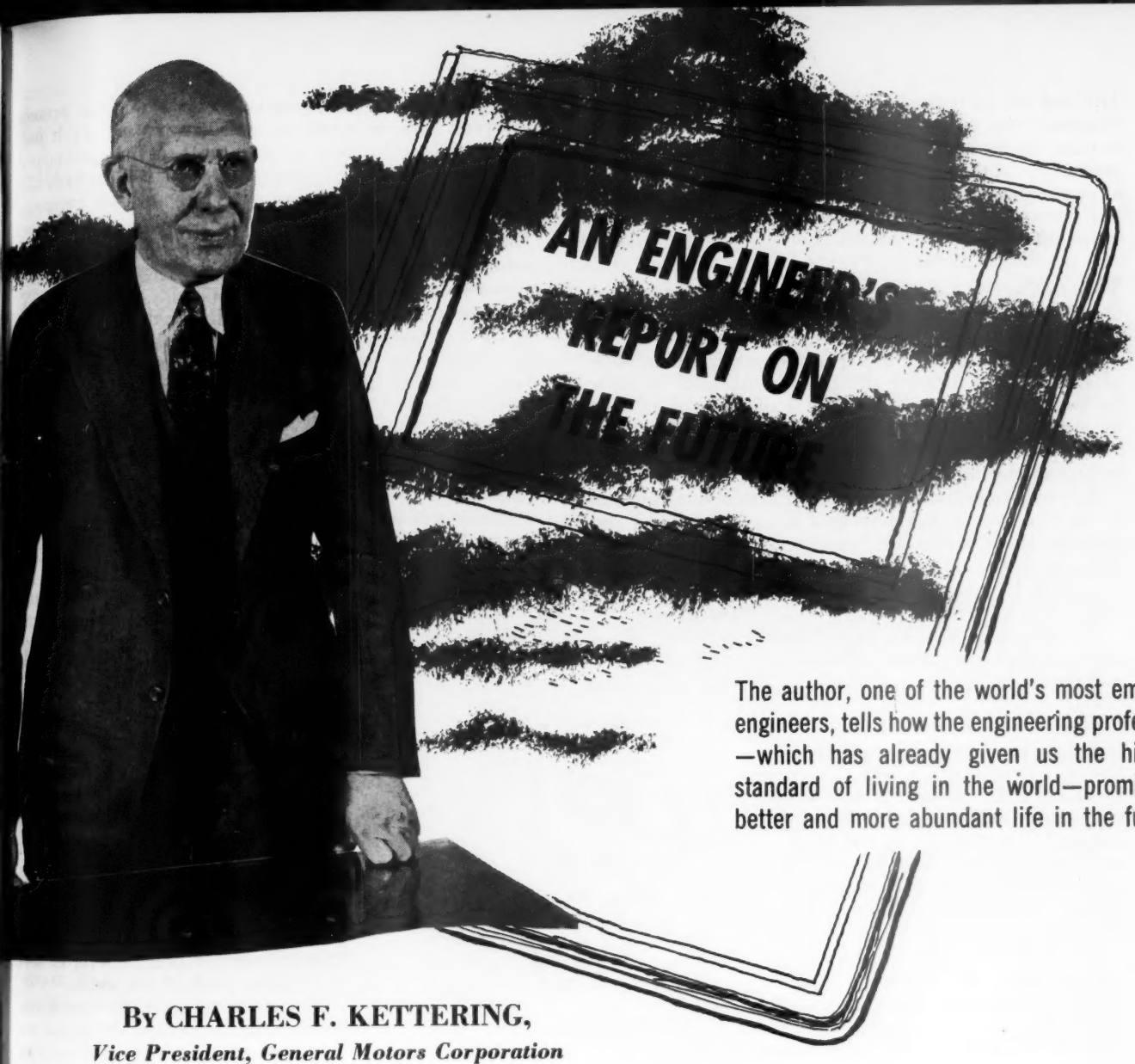
At the hearing, which was held in Miami, the five-member state board heard several other engineers testify that Farrant's structural design for three south Florida reinforced concrete jobs were "faulty and negligent."

Farrant, in turn, submitted 23 letters from other engineers, architects, and general contractors attesting to his ability. He also submitted a list of projects on which he worked while associated with architect Robert Law Weed in Miami and a list of projects he had designed since going into business for himself.

* * *

A plan to alleviate the shortage of engineering and technical personnel was presented and discussed recently by Dr. Robert Love, Director of the Evening and Extension Division of the New York City College of Business before the City Council there. The plan was based on the assumption that an engineer is and should be a supervisor and executive, rather than a mechanic.

It advanced a program of dividing the many jobs performed by engineers into specialized techniques not requiring engineering training and thereby, freeing the qualified professional engineer to perform the more important engineering work.



AN ENGINEER'S REPORT ON THE FUTURE

The author, one of the world's most eminent engineers, tells how the engineering profession —which has already given us the highest standard of living in the world—promises a better and more abundant life in the future.

By CHARLES F. KETTERING,

Vice President, General Motors Corporation

It has been exactly 100 years since America's first engineering society was founded. We might logically ask the question: "What has engineering done?"

One hundred years ago, 85% of our people were needed for the production of food and clothing. Today the situation is nearly reversed. About 15% of our people are running farms and producing food and the rest are in cities and industrial work.

People have complained: "We are wearing out our land."

A recent report says that the average value of land today is higher (not dollar-wise, but in productive value) than it was 10 or 15 years ago. Recently I saw an article by Dr. Firman Bear, of Rutgers, in which he said it is possible to feed 500,000,000 people in America. We are feeding 200,000,000 now. We have 150 million of our own and we are feeding about 50 million outside.

People say, "How can that be?" It is simple. In the last 25 years we have converted to farm tractors. The horse population has declined 18 or 20 million. Every time we do not feed a horse, we can feed 4½ people. I admit this is a little hard on the horses. We do not need to farm as many acres of land today as we did 20 years ago for the same standard of food production.

Never in the history of the world have there been such opportunities for expanding the technological results of every field—of every branch of engineering. For example, we are just scratching the surface of the field of agricultural chemicals today. Modern science has developed new materials which work only on the physical conditioning of the soil. It gives us, at last, a chance to separate the chemical properties of soils from the physical aspects.

But what about other natural resources? The United States represents 6% of the world's land area and 7% of its population. But from a material standpoint, we are completely disproportionate in the things that we have. We have 70% of the telephones; 90% of the bathtubs of the world, (if that means anything or not). We have 70% of the automobiles, 90% of the television sets, about 35 or 40% of radios. The list could go on and on. I am not saying that those things have anything to do with essential civilization. I am only asking the question, "Why do we have it?" "Why are we different from other countries in this respect?"

Some people say, "We have used up our natural resources to gain material wealth." Let's do a little evaluation. One of our greatest resources is fuel. Less than 5% of the total coal in our country has been taken from the mines, only 6% of oil and only a small percentage of natural gas has been used. We have shale rock in Colorado that contains six times as much oil as we have ever used.

And that can be multiplied by many times. We have not exhausted our natural fuel resources or our power resources. In the same length of time that we had been taking fuel out of the ground, we have improved the efficiency of our engines so that what we have in the ground today has been multiplied by at least two. We have gained, rather than lost.

WE find out we have not exhausted our natural resources to any great extent. That is not the reason we have our disproportionate material civilization.

We are great users of power in the world. About 98% of all our effort to move things is mechanical. In some backward countries only about 33% of the work is done by mechanical devices. The standard of living is almost exactly in inverse to the amount of power that is furnished by human muscles.

As we all know, power in our solar system has its origin in the sun. Nature has developed ways of storing it and releasing it. Man from the beginning has sought ways of harnessing and using it. Nature provided the original converters by transferring the stored energies in food to man's muscles for work.

We have become conscious of the fact that if we keep on friendly terms with the sun, we can write our own ticket.

Take a specific illustration. A friend of mine is a principal stockholder in the United States Sugar Company at Clewiston, Florida. This year they made 110,000 tons of sugar. If we take out the hydrogen and oxygen that is in sugar, the material shipped would contain between 45 and 50 thousand tons of carbon, the same as coal.

The stalks that were crushed were burned under their boilers to fuel a 5,000-6,000 kilowatt power plant. All the stalks were not burned. Some were dried, baled and sold for animal bedding. If you consider the carbon that was fixed in that part of it, there was over 100,000 tons. Roughly, 100,000 tons of carbon was fixed on an area the size of a township, about 36 square miles. The production of these cane fields was about 36 tons an acre per year. The carbon in that great crop came from the atmosphere. There are about 300 parts of carbon dioxide per million parts of air, and about 2/5 of that total amount of carbon dioxide is carbon. So a part of the energy of the sun on a township size fixed over 100,000 tons of carbon. A very important thing.

We are dependent upon energy from the sun. Our coal, oil and gas are the bank account that the sun has deposited for us.

We are in exactly the same position as the farmer who worried about what he would do for rail fences once the woods were all cut. He quit using rail fences long before the woods were gone. I believe we are going to quit digging coal while there is still coal in the earth. We will raise our fuel just as we did when we used horses on the farm. One acre of ground ought to be enough to run an automobile for a year.

We are just beginning to mine the sea in a very small way. Bromine, a product we get from mining the sea, originally had only a small demand for photographic work and bromo seltzer. The entire world produced only about 800,000 pounds a year.

When we needed more bromine badly to make ethyl gasoline we realized that 800,000 pounds would not do us any good because we needed at least 20 million pounds per year. Everyone told us we could not get it. It just was not available. Now we know that there is one pound of bromine in 10 tons of sea water. Last year we took 125 million pounds of bromine out of the sea at Freeport, Texas. To get it, we pumped 1/10 of a cubic mile of water. There are 320 million cubic miles of sea water. Here is a natural resource we do not use up, because long before it is pumped out, it is running back.

A few years ago we contracted with the University of Miami to grow algae. Algae is the green scum that grows on ponds. The particular algae we are interested in is called "blue-green" algae.

THE blue-green algae that grows in the ocean is red. We wanted to see if we could grow it away from the ocean. We took water out of the Gulf Stream and removed all of the organisms from it so that nothing was left but mineral sea water. The algae would not grow. It was getting something from the other organisms.

By adding extra potassium, phosphorous, and calcium, it did begin to grow. We shipped some water and algae to Dayton, Ohio, and it grew there. Then one of our men said, "What is the use of shipping water? We can take distilled water and add salt and other things that we know are in sea water."

We have a list of all things that are supposed to be in sea water. We made synthetic sea water. But the algae would not grow in it, not even if potassium, phosphorous, and calcium were added. However, if a teaspoon full of natural sea water were added, it would grow. These little plants will detect as little as one part of a mineral in several billion pools of sea water.

How do we measure these trace materials? Our great difficulty is that we have measured as far as we can chemically, then with the spectroscope, and by other means. When we did not have any more measuring instruments, we said, "It is not there." The plant tells us that we are wrong. In the field of biology we are getting a perspective of what the problem really is. We are going to make tremendous advances.

There is one natural resource which people seldom talk about. It is *time!* Everybody has the same ration every day—24 hours. Since we have individual freedom in America we have used our time better, more productively, more intelligently.

We have another advantage in this country that few have grasped. That is "mass production"—the ability to make pieces alike. The first invention to use "mass production" was the printing press. When Gutenberg invented movable type it could be set up to print anything. Every time paper went through the press, it printed exactly the same thing. What was written may not have been worth reading, but it was the same.

Our industries, through our great tool manufacturers, enable us today to make pieces that are exactly alike. No other nation has ever equaled what we have done.

The two natural resources of time and the sun are regularly distributed over the earth. We are fixing only about 1/10 of 1% of the sunlight today. If we can develop new types and ways of doing things so we could fix 2/10 of 1%, we would double the food supply of the world. That seems to be worthwhile. Only about 15 or 20% of the

people of the earth have ever had enough to eat. This opens a great field for technology and engineering.

If we read just a little bit of history, we learn that the troubles we have today are picnics compared to what the world has had. One difficulty is nothing but a mental attitude of people who want to arrive at a destination. To my way of thinking, there is no destination outside of the undertaker's room. As long as we are alive, we are living in a world of change. We are going to know more tomorrow than we did today. We are going to do things different tomorrow than we did today. We are never going to do anything set to a definite pattern.

How simple things are when we get them reduced to simple terms that people understand! We are only too likely to bury simple ideas under Latin or Greek synonyms.

ENGINEERING is not writing papers. It is not grand theories. It is giving the customer something he can use that he does not want to make himself. When I first began work on the diesel locomotive, a friend told me that there was a great study that declared it impossible to make a diesel locomotive. It was a big, leatherbound report entitled *The Comparative Cost of Operating Steam Locomotives vs. Diesel Electrics.* I said, "I will not read this because the title is not right. No one knows what the cost of operating steam locomotives is."

He said, "We do."

I said, "How close do we know it? We would have to put the word "probable" in the title because no two divisions even of the same railroad keep the cost of operating their locomotives the same."

"You are right on that," he admitted.

"Now what do we have for a title?" I asked. "*A Guess Within Thirty Per Cent* (plus or minus 15%, the standard figures of error) *Of What it Costs to Run a Steam Locomotive vs. the Pet Prejudices of a Man Who Never Saw a Diesel Locomotive.*"

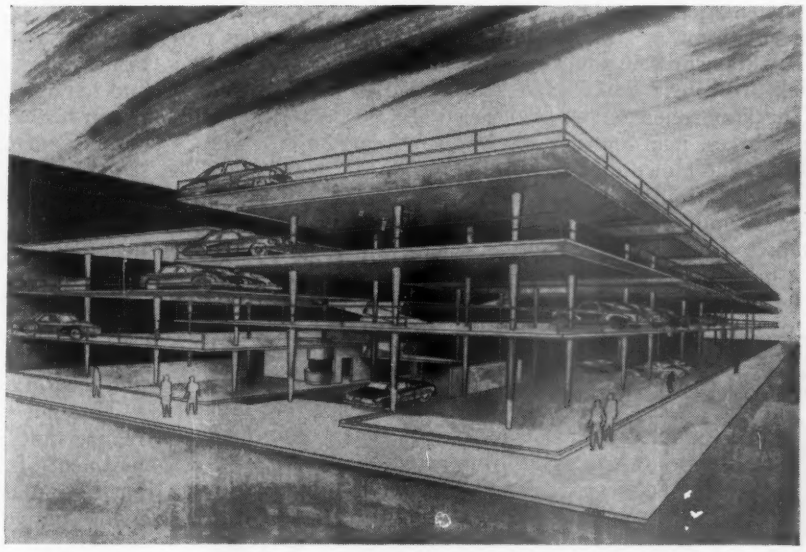
"Do you think human progress ought to be based on a report like that? The only way to find out if a diesel locomotive will work or not is to build one and put it on the railroad. If the management keeps it, it is all right. If it is sent back, it is no good or we have not sold it right."

We have all seen the advertisement of a boy tearing down an old Model "T" Ford and putting it together. The caption said, "All of our airplanes return safely." That is education, just as much as the other kind.

How to do things with ones hands and how to think things with ones mind are the great factors in education. Never was there such opportunity for both as there is now. If I were writing a big banner to put up in front of the readers of the AMERICAN ENGINEER, I would say: "This is the age of opportunities unlimited, *provided we recognize that the age of opportunity unlimited is made up of fingers that know how to do things and minds that know how to think things.* (A group of people made up of individuals who do not know anything cannot do anything.)

Individual freedom, the better use of time, and an understanding of how to duplicate products are the three things that have been most important in giving us our extraordinary position, in my opinion.

Today, we need to recognize that in eight hours of work, eight hours of sleep and eight hours of recreation, the important thing is what we do in the eight hours of recreation. How much do we work with our minds? How much do we work with our own hands? What are we learning to do? What can we do all by ourselves? Today we need to recognize that individuals who know how to do things, individuals who know how to play instruments, can combine to make a great orchestra. Individuals who know how to do things and have an incentive to do the things can make a great country. That is why we have one.—***End.***



The United States has about 70% of the automobiles in the world. Such a high standard of living, according to Dr. Kettering, noted General Motor's engineer, has come about largely because we have learned to make pieces alike or, as it is commonly called, mass production.

A Public Service Activity for Engineers . . .

MAKING OUR AIR CLEANER

— An American Engineer Photo Story —

NSPE members seeking constructive fields of public service where the talents of the professional engineer can prove of value to their communities, should consider the advantages of participating in Cleaner Air Week, October 20-26.

Smoke and smog are two of our nation's less spectacular enemies, but they exact a tremendous toll. Blackened cities, respiratory diseases, ugly living conditions and the loss of hundreds of millions of dollars to industry are only a part of this toll.

The engineer is the key man in correcting this deplorable condition.

The key words in this year's campaign for Cleaner Air Week are "engineering" and "education."

The atmosphere above America's cities is polluted by two sources, man and nature. Nature's contributions are pollen, wind-blown dust from eroding soil, decaying vegetation and similar items. Man's malefactions are much more serious—smokes, gasses, etc. These combine to produce the bane of our cities—smog, which is defined as a haze of fumes, gases and fine dusts (invisible to the eye) and smoke, fly ash, soot and larger dust particles which combine with the water droplets of fog.

The British are coming! This is what happened in colonial days to a house owner with a smoky chimney. Along came the Red Coats and off to jail.

For over three decades professional engineers and others have attempted to overcome public apathy to the problem by sponsoring Cleaner Air Week. Fortunately, more and more civic groups are cooperating.

Smoke from a chimney was once a sign of warmth and comfort in the home during cold weather, and, as industries developed, smoking stacks were indicative of a community's prosperity. But now that he is getting to know better, man is coming to demand cleaner air along with his comfort and prosperity, and in many communities he has set up legal machinery to protect his wife's washing and his own white shirts from unnecessary soot originating in his neighbor's chimney and from too much fly ash coming out of the stacks at industrial plants in the area.

Cleaner Air Week is sponsored by the Air Pollution Control Association (founded in 1907), a large portion of whose membership is made up of smoke control engineers and inspectors from cities of all sizes and with the whole spectrum of topographical and industrial conditions contributing to air pollution. Other members include representatives of coal, oil, gas and chemical companies, manufacturers, railroads, and public utilities, and of state and federal agencies.

Through Cleaner Air Week the public is brought to realize that in the modern industrial community a department of air purification must be set up on the same basis as a department of garbage disposal or fire and police bureau. The problem of purifying the air is an *engineering* problem, and an engineer is the logical person to take charge of such a program regardless of the size or location of the city. As in other departments of public service, a substantial budget must be made available to the air purification experts, and a sensible code must be incorporated into the community's ordinances to enable those responsible to carry out their duties with authority.

Columbus, O., one of the nation's important industrial and residential cities that has combatted air pollution with a high measure of success, adopted "engineering" and "education" as the key words in the community project. After engineers made a survey of plants considered to be the principal sources of air contamination in Columbus, the smoke control engineer began a long-range program to encourage repair or replacement of worn-out or run-down boiler and heating equipment. Night schools were set up for operators of power-heating equipment, building owners and employees, and for railroad men. Here experienced combustion engineers explained the theory behind the crusade: that no fuel will smoke excessively if it is burned with proper equipment and in the proper manner. Home owners were also invited to classes featuring furnace tending and upkeep, and Boy Scouts made a door-to-door distribution of illustrated pamphlets explaining the fundamentals of the anti-smoke program.

THIS plan of attack has also been successfully utilized in

Three steps to take to aid in cleaning up the atmosphere:

Above, left. *Equipment.* Experienced engineers say that no fuel will smoke excessively if it is burned with proper equipment and in the proper manner.

Above, right. *Education.* Some cities and plants use night schools to instruct operators of heating equipment, building owners and employees, etc., in proper operative methods.

Below. *Engineering.* The problem of purifying the air is an engineering problem, and he is the logical man to take charge of local programs.

scores of other cities, with the result that great progress has been made in reducing smoke over U. S. centers of population. Industry has made distinct progress toward eliminating fly ash, soot, dust, fumes, and odors that were once discharged into the atmosphere without regard to efficiency or cleanliness. Equipment manufacturers have come into the picture with a variety of dust and fume collectors, industrial stokers, overfire jets, and an assortment of gadgets that save fuel bills while reducing atmospheric pollution.

More efficient use of fuels in the current defense program is one of the factors emphasized by Secretary of Commerce Charles W. Sawyer in his petition to the American people to comply with the objectives of Cleaner Air Week.

"Installation of equipment to prevent or reduce air pollution can result in substantial reductions of costs to industry," Mr. Sawyer has said. "I refer to the visible costs of such items as fuel, factory upkeep and maintenance—including cleaning of buildings—and such hidden costs as time lost through absenteeism or illness on the job caused by noxious fumes. America cannot afford such a waste of materials and energy.

"We are in the midst of a tremendous industrial expansion—one which promises to continue at an impressive rate into the future. At the same time our traffic and population are steadily growing. Unless the proper precautionary measures are taken, this broad growth can only lead to increasing pollution of the air by smoke, dust, soot and fumes, representing a hazard to health and a grave source of economic waste."

The Air Pollution Control Association is showing how the proper precautions can be taken, and—according to early responses to the Cleaner Air Week announcement—the crusade that has been in the making for 45 years is at last beginning to receive the attention it has merited from the start.—***End.***

Michael Baker, Jr.

The Engineer Who Is Rebuilding An Entire Nation

One of the Most Amazing Success Stories in Engineering History Is That of Michael Baker, Jr. His latest project is the modernization of Saudi Arabia. Here is Mr. Baker's Philosophy on Engineering and Success in the Engineering Profession.

In April of 1940, Michael Baker, Jr., was discouraged—discouraged and broke. After struggling through engineering school in the face of great odds, he had gone into business for himself. He just missed a $400,000 construction contract by bidding $500 too much, and then went into a strip coal mining venture which proved a financial fiasco.

Renting a small hotel room as an office in his home town of Rochester, Pennsylvania, (it was six months before he could pay the rent or his secretary's salary), the 28-year-old Baker began writing letters, thousands of them, seeking engineering work.

His first job was a $25 survey. A little while later a $40 drafting order came in. With stubbornness and grit, Baker persevered. By the end of 1940, he had a full-time staff of eight people and a gross business of $15,000.

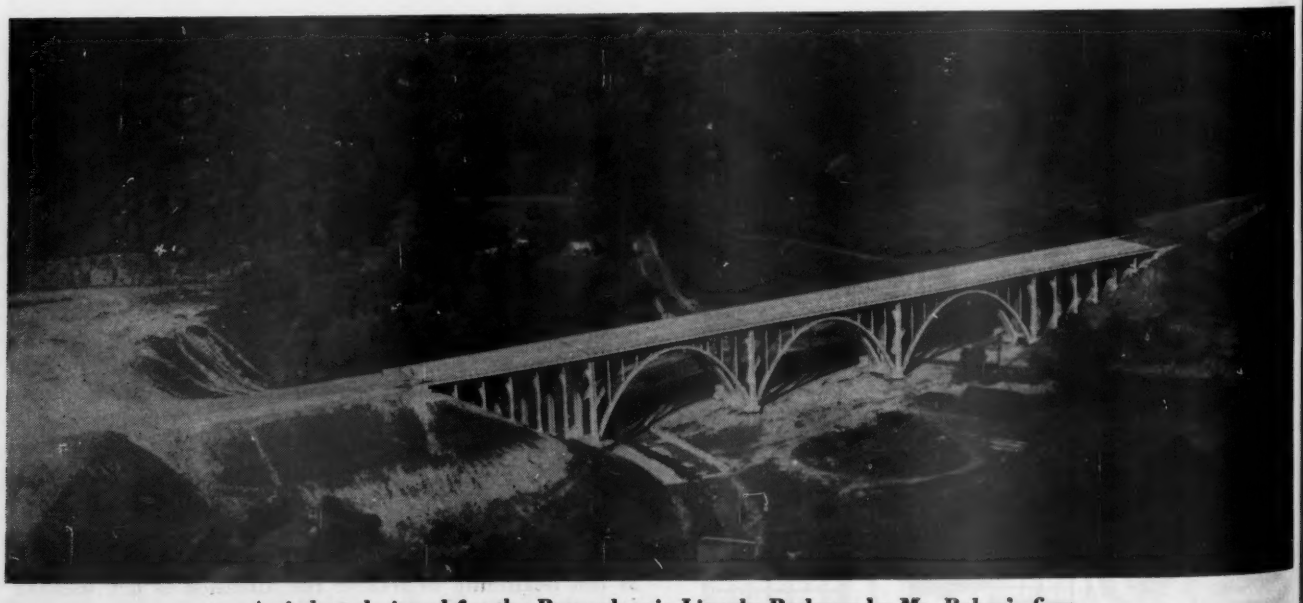
His business boomed. In 1941, his volume of business was six times as much as in 1940, and it kept growing. In the past eleven years, Baker has engineered more than a *billion* and a half dollars worth of construction work all over the globe.

When World War II erupted, Baker attempted to obtain government defense work, but found himself stymied because of his youth and lack of experience at handling large projects. Then, opportunity knocked. The Rust Engineering Company of Pittsburgh needed eleven survey parties in five days—to be ready for work in Paducah, Kentucky at a TNT plant. Baker didn't have a single survey party but he went to work and rounded up the necessary personnel. Once at work, his men turned in a top job in record time.

The incident gained Baker a reputation for speed and accuracy. More work for the Corps of Engineers rolled in: at Fort Benning, Ga.; Camp Rucker, Mobile; Jacksonville, Fla.; Atlanta; San Antonio and Miami. His "war baby" business had operations stretching from Alaska to Brazil, where his men hacked out 14 airfields from the South American jungle. Other Michael Baker, Jr. engineers worked in the Azores, Curacao, Aruba, Trinidad, Tobago and the Guianas. The firm that began with a $25 survey found itself the possessor of a million dollar business.

After V-J day, many freely predicted that Michael Baker, Jr., Inc., would fold as had many another "war baby." Not so. Baker's firm continued to grow. Mr. Baker's latest

(*Continued on page* 31)



A viaduct designed for the Pennsylvania Lincoln Parkway by Mr. Baker's firm.

A MESSAGE OF IMPORTANCE TO ALL N. S. P. E. MEMBERS!

We all know that membership is the most pressing problem confronting our Society. A sound growth in membership is the key to a more effective professional organization, the key to professional unity, and the key to adequate representation of the engineering profession. While we have steadily progressed in membership, a look at the potential shows there is a great opportunity for a faster and more substantial growth.

In spirit, every member of N.S.P.E. is a member of the Membership Committee. In that spirit we ask you to participate in the program outlined on the following page. If each of us will do this little bit NOW we will bring the facts concerning NSPE to more than 27,000 registered engineers who are not now members. Let us all do our part in this way,

For a Greater Engineering Profession

John D. Coleman,
President.

Turn This Page To Find Out About One For You In '52 ➔

1 for you in '52

Your Personal Five Minute Membership Campaign—A Practical Way to Make the familiar slogan, *"Every Member Get A Member,"* a reality.

If each member will take just five minutes of his time, a few pennies for a stamp, and follow these simple instructions we may anticipate a growth in membership never before equalled.

here's what **you** do

1. Remove the center sheets from this magazine, being careful not to tear them.

2. On page 3 of the double sheet fill in the amount of your State Society Dues and Chapter Dues and then show the total amount of dues, including NSPE dues.

3. On the back page PRINT your name and address as the sender and then PRINT the name and address of a registered professional engineer who is NOT a member. (If you send the mailer to a PE who is not located in your chapter area please ascertain the correct amount of Chapter dues for the Chapter with which he would be affiliated.)

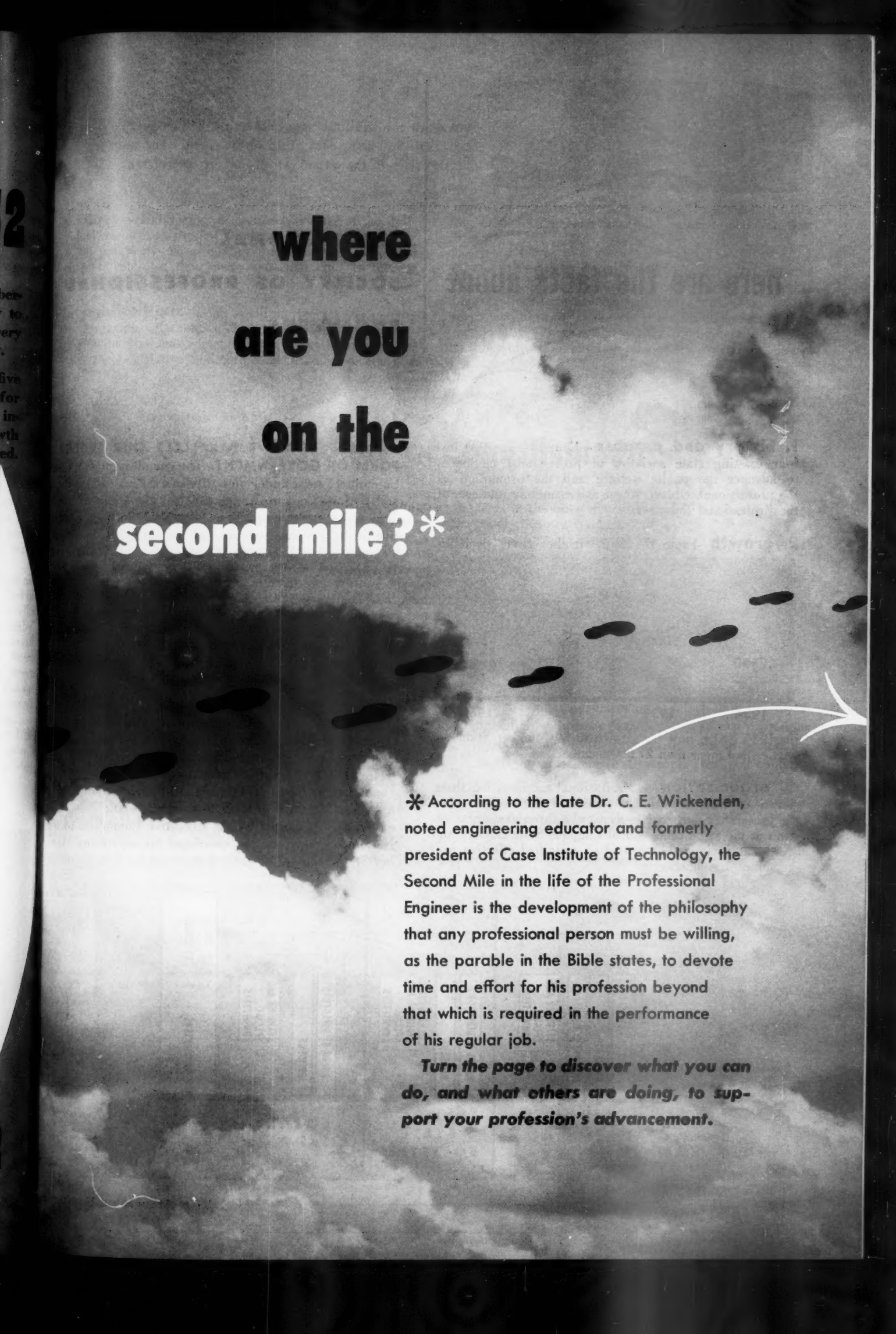
4. Fold the center sheet so the addressed portion is visible, place a stamp in the place marked and mail it.

that's all there is to it

When the completed application form comes in to the NSPE Headquarters Office your name will be noted for publication in the AMERICAN ENGINEER as a member who DID HIS PART IN THE '52 MEMBERSHIP PROGRAM.

The completed application forms, with attached checks, will be sent to the appropriate State Society Secretary for processing in the normal manner.

1 for you in '52



*According to the late Dr. C. E. Wickenden, noted engineering educator and formerly president of Case Institute of Technology, the Second Mile in the life of the Professional Engineer is the development of the philosophy that any professional person must be willing, as the parable in the Bible states, to devote time and effort for his profession beyond that which is required in the performance of his regular job.

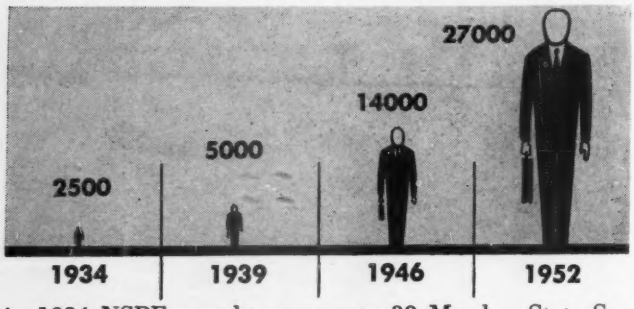
Turn the page to discover what you can do, and what others are doing, to support your profession's advancement.

here are the facts about

THE NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

1. history and purpose—Founded in 1934 by four existing state societies of professional engineers to advance the public welfare and the promotion of the professional, ethical, social and economic interests of the Professional Engineer.

2. growth—From the four Member State Societies



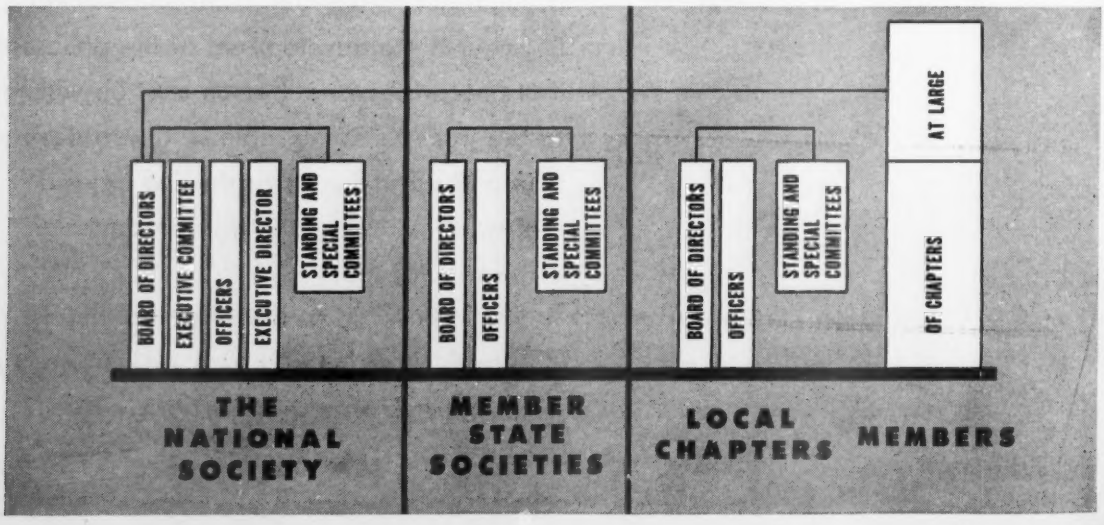
in 1934 NSPE now has grown to 39 Member State Societies and more than 27,000 members.

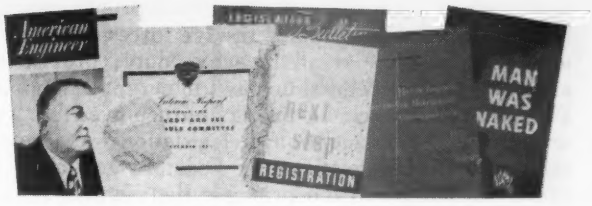
3. organization—A Professional Engineer has three levels of interest — local, state and national — when he joins NSPE he becomes a part of a three-level organization at the same time—Local Chapter, State Society and National Society, thus providing a unified effective professional organization.

IN MANY WAYS IT PARALLELS OUR FEDERAL FORM OF GOVERNMENT. The Standing and Special Committees exist under authority of NSPE's Constitution and By-Laws and are responsible for the study of problems and the recommendation of policies in their respective fields. These policies are carried out by the Executive Committee, the Executive Director, and the Washington Headquarters Staff.

The State Societies are parallel in organization and operation to the National Society. They represent the interests of members in state affairs and are the channels through which members exercise the democratic control of the National Society assured them by the NSPE Constitution and By-Laws.

NSPE exists for its members and they, acting through their own local chapters, govern both the Member State Societies and the National Society. In the annual elections they select their own officers, those of the State Societies, and the Board of Directors of the National Society (one director for each 500 members or fraction thereof in a state). Members at large in every state and possession of the nation, elected by the Executive Committee of the National Society, are the spearhead for organizing Member State Societies in states that do not yet have them.





National, State and Chapter publications keep the member interested and informed on current activities at the three organizational levels.

4. dues—The Society is financed by dues of the individual members—present National Society dues being $7.00 per year. The Member State Societies and local chapters establish their own additional dues to finance their activities.

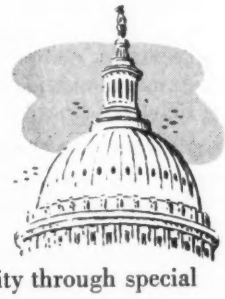
5. publications—Each member receives the monthly magazine, AMERICAN ENGINEER, official publication of the National Society. Upon request members receive the Legislative Bulletin. Members also receive the appropriate State Society magazine, chapter publications and other National and State publications issued from time to time.

6. membership qualification—The National Society of Professional Engineers is the only engineering organization composed exclusively of professional engineers who have registered under a state engineering registration law. (There is a provision for engineer-in-training membership while obtaining necessary experience for full registration.)

A PROGRAM OF
professional accomplishments

In addition to the basic facts you are interested in the Society's programs, its activities, and its accomplishments. These activities are conducted at all three levels of our organization, implemented by appropriate committees and headquarters offices. Within the more than 300 local chapters, 39 Member State Societies and the National Society there are over 2,000 committees of professional engineers working for the advancement of the profession.

Here are some of the principal fields in which they are working, what they are doing in those fields, and what has been accomplished:



• **legislation**—Close attention is paid to all legislation which affects the engineering profession, both at the state and national levels. The National Society publishes a monthly Legislative Bulletin which is available to all members upon request. State Societies report on legislative activity through special bulletins and state publications.

Recently, NSPE obtained exemption for professional engineers from national salary controls. In cooperation with other organizations, special provisions were obtained in the Taft-Hartley Act to protect the rights of professional engineers. The National Society, with the active support of the State Societies, supported and coordinated a successful effort to obtain a registration law in the District of Columbia. Cur-

Membership Application

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Name _____
print — last — first — middle

Residence Address _____ ☐
Street — City

Business
Address _____ ☐
(please give postal zone) — (check mailing address)
Company Affiliation _____
Title or Position _____

Education: _____
Univ. — Degree — Date

Registered in the following States:
State — Registration No.

If former member of N.S.P.E.
State — Date

Signature _____ _____
Date

To Become A Part Of The Professional Organization For Professional Engineers—complete this form and return it to NSPE, 1121 15th St., N. W., Washington 5, D. C., with your check for the amount indicated.

DUES

National Society $7.00
State Society . . $
Chapter . . . . . $
Total . . . . $

The above dues cover 1953

Make check payable to National Society of Professional Engineers.

rently, efforts are being made to provide proper safeguards for engineers in the military reserve forces in connection with their possible recall to active duty; provision for amendment of the federal tax laws to permit self-employed PE's to equalize their income tax burden over the "good" and "bad" years; adoption of legislation for a study of salaries and classifications of Federally-employed engineers; promotion of the principle that natural resources should be developed by private enterprise. Other fields of study and activity are: social security, advance planning of public works, federal research and government contract requirements.

The State Societies have an equally broad program of legislation at the state level on a similar variety of subjects, all vitally affecting the profession. And the chapters are active in the legislative field at the county and city level on such matters as building codes, fire regulations, procedure for selecting engineering personnel, sanitation, civil defense, and a host of other subjects all directly related to the non-technical professional interests of Professional Engineers.

- **public relations**—As part of a broad public relations program, a series of Executive Research Surveys has been undertaken. The first report on Engineering Communications has been enthusiastically received by industry and the profession. The second report on Utilization of Engineers is on the press. The third report will deal with Training of Engineers. This $40,000 program has been hailed as a great forward step toward informing industry and the public about the engineering profession and is especially timely in view of related Society activities seeking to relieve the engineering manpower shortage.

  Another significant program in this field is the annual celebration of Engineers' Week. This program each February brings the engineering profession to the attention of the entire nation by means of national radio hookups, state and local broadcasts, industry participation, local business displays, feature newspaper and magazine articles, and appearance of PE speakers at civic group meetings.

  All three levels of the Society conduct year-round Public Relations programs by means of news releases, feature reports, interviews and other media.

- **registration**—Although there is now an engineering registration law in every state, territory, possession, and district of the United States, there remains much work to be done to improve, modernize and strengthen these laws. Among the problems being given attention are: reciprocity, examination procedures, engineer-in-training registration, membership of the state boards, and a variety of suggested amendments to the state laws based on local conditions and circumstances. The National Society receives information from the states on important changes and recommendations, and disseminates this valuable information to the other states.

  The National Society has made arrangements for a cooperative publication of a Compendium of Registration Laws which will be the first book bringing the pertinent information on registration laws into one publication, including valuable court decisions interpreting the several state laws.

- **ethics**—All three levels of the Society have active programs to improve ethical standards of the profession. Many studies have been made of particular problems, and policies have been adopted regarding free engineering services, competitive bidding for engineering services; Canons of Ethics have been adopted, and arrangements have been made in certain states for appropriate listing of Professional Engineers in the telephone directory. The National committee is currently developing Rules of Ethical Conduct.

- **salaries and fees**—Mention has already been made of NSPE's accomplishment in removing PE's from federal salary controls. The Salary and Fee Committee has published two reports on salary and fee surveys and has presented a recommended schedule of engineering grades and classifications which is being studied by the Board of Directors. A national engineering salary survey is being prepared. Other study projects cover job classifications, job evaluations, salary ranges. The State Societies have studied salary and fee standards in their own areas and have published recommended minimum fees and salaries.

- **collective bargaining**—Detailed attention has been given to the effects of collective bargaining on industrially-employed engineers. NSPE is on record as being opposed to collective bargaining for professional engineers. A complete file of pertinent information is maintained and significant decisions of the National Labor Relations Board are reported and analyzed.

- **and many others**—Space does not permit coverage of the many other fields of NSPE interest and activity. But there are many others such as: Inter-Professional Relations, Education, Aid to Young Engineers, National Defense and Public Service Projects. In addition, the NSPE Headquarters Office and the State Society Headquarters Offices are your offices for spot information and assistance on individual problems.

for a greater profession for all . . .

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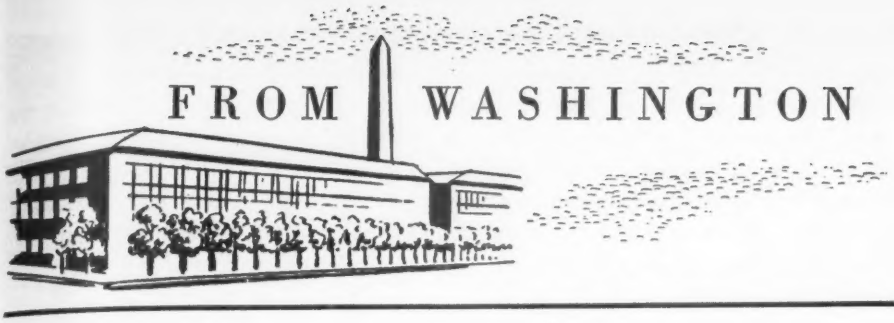


By
Milton F. Lunch
NSPE's Legislative Analyst

THE OFFICE OF DEFENSE MOBILIZATION, top-level agency in the government's non-military defense organization, has called upon employers, professional organizations, educational institutions, and government agencies, **to participate in a broad and comprehensive program to meet the nation's needs for engineers and scientists in the defense effort.**

Many of the recommendations, set forth below, tie in with current NSPE activities, such as the **Executive Research Survey on utilization of engineers,** the forthcoming report on Training of Engineers, guidance to high school students on an engineering career, salary information surveys, and recommendations to military agencies on proper assignment of engineering personnel.

A DEFENSE MANPOWER POLICY STATEMENT, entitled **"Training and Utilization of Scientific and Engineering Manpower"** declares that **"the importance of scientists and engineers in the establishment of the strongest possible defense and, should war come, in insuring ultimate victory, is well established and widely recognized."** The statement recognizes that "the realities of international relations indicate that intensive activity in the fields of engineering, science and industry development must be made a more important aspect of our continuing national security. This means an unprecedented and sustained demand for specialized manpower in a great variety of fields."

DESPITE THE FACT THAT VERY LARGE NUMBERS of students have been trained in science and engineering since World War II, stringencies of engineers and scientists now exist in some fields and acute shortages are in immediate prospect, the statement declares. To support the need for growing numbers of engineers, the statement notes that the **number of workers per engineer in the basic commodity producing and transporting industries has decreased continuously from an approximate 250 in 1900 to approximately one-quarter of that in 1950.**

Vigorous and intelligent action in the utilization of specialized manpower in the armed forces and in civilian activities is required to meet the high demand and low supply, it is declared.

IN CONNECTION WITH THE CURRENT SHORTAGE OF ENGINEERS, the statement observes that the situation has been caused in part by the increased demand for defense activities without a corresponding decrease in non-defense programs. Also, the very small number of persons trained in the engineering field during World War II accounts for the limited supply at this time. It is indicated that an upturn in the number of engineering graduates will not occur until 1955. In view of these facts the statement promulgates three basic policies:

1. To utilize most efficiently existing resources of scientific and technical skills in private industry, in the civil government, in the armed forces and in educational institutions.
2. To develop increasingly reliable information regarding requirements and resources of scientists and engineers to meet both immediate and long-term national needs.
3. On the basis of needs indicated under 2 above, to attract and train the additional number of able young men and women required for scientific and technical fields.

SUGGESTIONS TO PRIVATE ORGANIZATIONS AND RESPONSIBILITIES for government agencies are set forth in detail along the following lines:

Employers of engineers are urged to meet increasing demands by **improving their utilization techniques.** Particular attention should be given to identifying and utilizing scarce personnel of exceptional ability in work which will make full use of their capacities. **This suggestion is explored in detail, based on an extensive survey, in NSPE's Executive Research Survey on utilization of engineers which will be released the middle of next**

(Continued on next page)

(Continued from preceding page)

month. Other suggestions to private employers include improved programs for selecting and training sub-professional personnel to do work which requires less than the full training of professionals, to maintain programs for continuous review of performance and compensation of engineers to assure that salaries are commensurate with the contributions being made by such personnel, cooperate with educational institutions in the development of on-the-job or off-the-job training programs, re-examine personnel policies to assure full utilization of women and members of minority groups having engineering training, and submit timely data on Selective Service classification and reservist recall notices for those employees having professional qualifications and duties in the scientific and engineering fields.

PROFESSIONAL ASSOCIATIONS OF SCIENTISTS AND ENGINEERS are urged to undertake informational programs to attract qualified students for training; develop relevant information on requirements, employment, salaries and working conditions; and cooperate with educational institutions in studying the adequacy of existing curricula in engineering; develop better teaching methods and seek maximum utilization of teaching facilities. NSPE is already active regarding these suggestions through an extensive program of counseling high school students and others having an aptitude for engineering education and through the Education Committee's cooperative work with engineering colleges on many facets of engineering education. **On the economic front, NSPE's Education Committee has undertaken a survey of engineering faculty salaries and the Salary and Fee Committee is preparing the ground work for a national salary survey through State Societies.**

EDUCATIONAL INSTITUTIONS ARE URGED TO COOPERATE in securing engineering students by special consideration of those who lack pre-requisite high school courses; make further studies of the engineering curriculum, as regards both its content and its length; give consideration to acceleration of engineering education and cooperative work-study arrangements; study the causes of the high drop-out rates and take steps toward minimizing the number of such drop-outs; and to strengthen high school curricula in order that more high school graduates will be eligible for engineering education.

A number of government agencies are directed to take specific steps to assist in the overall program, although the responsibilities are general in nature. Some of the more significant assignments are:

Department of Labor—Strengthen its program of information on the supply of and demand for scientists and engineers; provide this information to private and public employers, schools, Selective Service System, and Department of Defense; expand its informational and placement service; encourage employers in maintaining realistic hiring specifications; and determine manpower shortages which can be met in whole or part by short-term training programs.

Selective Service System—Continue to apply the Congressional policy of deferring registrants whose activities are necessary to the national health, safety or interest; prepare semi-annually a report on the status of the student deferment program, indicating recommended changes.

Department of Defense—Review all military jobs requiring scientific and engineering skills and take additional steps necessary to assure that military personnel having engineering competence are assigned to military jobs requiring that level of competence, and military jobs requiring less than full scientific or engineering competence are filled by sub-professional personnel; maintain an inventory of current military manpower requirements in scientific and engineering specialties as an aid in determination of overall specialized manpower requirements as related to recall of reserves and to assignment or transfer of military personnel, and to review reserve policies to assure that engineering reservists are called to active duty only when the military services have need of the skilled personnel and that this need outweighs that of the defense-supporting or essential civilian economy, or when the reservist possesses highly developed, essential military skills which cannot otherwise be obtained. NSPE has proposed to Congress and to the Department of Defense a specific three-point policy which would implement these general ideas in a definite manner.

THE CIVIL SERVICE COMMISSION, the Atomic Energy Commission, the National Science Foundation, the Federal Security Agency, and the National Advisory Committee for Aeronautics are all assigned additional responsibilities in such fields as finding qualified engineering employees, development of training programs, development of research program collaboration among the agencies with regard to the highest degree of utilization of limited research personnel, encouragement of basic research, establishment of short training courses to develop draftsmen and engineering aides to assist professional personnel, **and work toward reducing the demands for engineering personnel to a minimum level consistent with national security.**

Head table scene at the NSPE dinner meeting at the Chicago Convocation. Standing is Master of Ceremonies V. E. Gunlock, member, ISPE, and Commissioner of Public Works, City of Chicago. On his right is guest speaker, Eric Johnston who is seen talking with NSPE President John D. Coleman.

Executive Committee Meets

Thousands Attend Chicago Convention

THOUSANDS of engineers from all parts of the free world traveled to Chicago in September to pay tribute to the American Society of Civil Engineers on the occasion of its 100th birthday, and to take a quick accounting of just what the profession had accomplished since 1852, and what the future held in store.

The discussions were held September 3-13 during the Convocation of engineering societies, and will be remembered as one of the highspots of the Centennial of Engineering which has been a leading activity in the Windy City during 1952.

Mr. C. F. Kettering, well-known General Motors engineer, and Chairman, Executive Committee of the Centennial, said in reference to the celebration: "We should take this opportunity of recognizing the tremendous service to our national progress which the engineering profession has helped make possible. In our present critical times it is important for us to take this opportunity of reviewing our history so that everybody, including our young people, will understand and appreciate why our American system has made us the world's leading nation."

Most of the visiting engineers attended technical sessions while their wives and families went to the Museum of Science and Industry to see the technical displays, movies, and a musical entitled "From Adam to Atom."

In the technical conferences, experts in mining, machine tools, communications, food, transportation, power, and so forth, covered the past accomplishments in their respective fields, and pointed to a fairly bright future. Many, however, viewed the shortage of technical talent with alarm and feared that this one problem could seriously handicap the Nation's progress if a solution was not found.

NSPE Has Two Meetings

The NSPE chose the September dates to call its Executive Committee into session, and to hold a dinner meeting featuring an address by Mr. Eric Johnston, Chairman of the President's International Development Advisory Board. (See AMERICAN ENGINEER, September, 1952.)

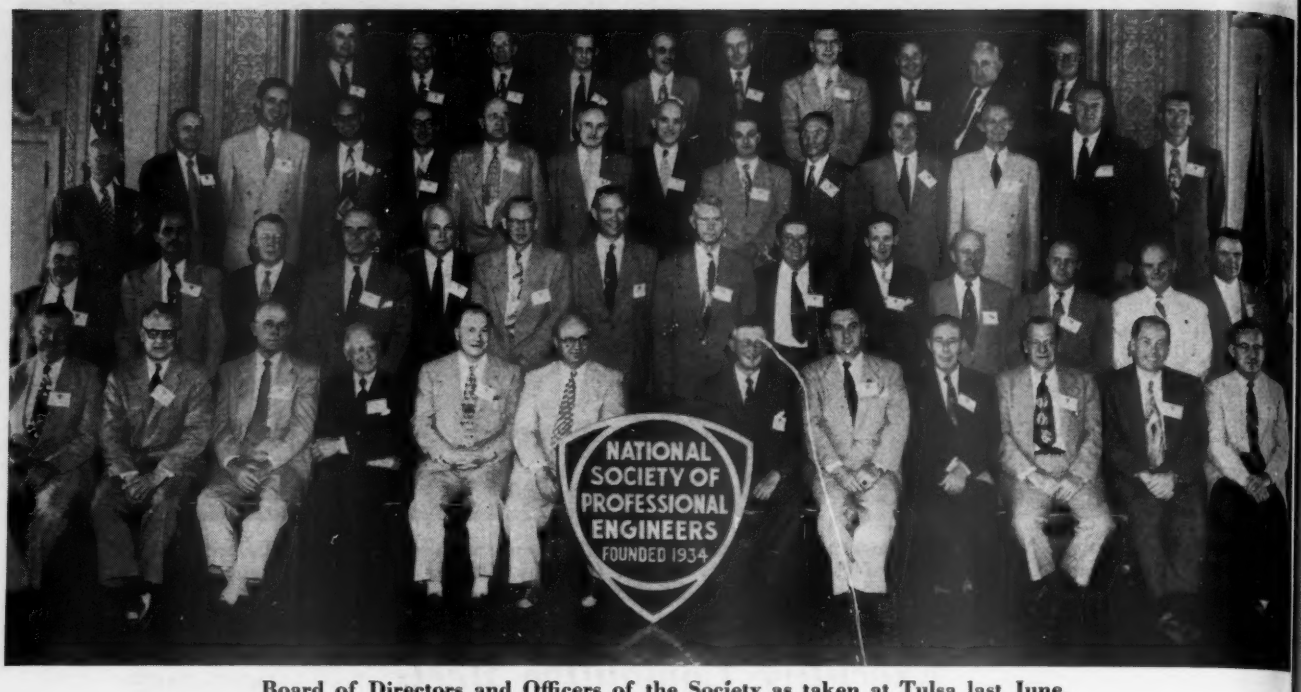
New NSPE President John D. Coleman presided over all day meetings of the Executive Committee to discuss the Society's active fall program. Given thorough study were such projects as the new "One For You in '52" membership program, the 1953 National Engineers' Week program, and the impending release of the second Executive Research Survey report, "How to Improve the Utilization of Engineering Manpower." Latest developments on these items are

1. Promotional kits to aid in the membership drive have been sent to State and Chapter officials (See also pages 15-20, this issue).
2. Promotional kits of National Engineers' Week will be mailed from October 1-15.
3. The second report on Utilization will be released about November 15.

The second meeting held in Chicago by NSPE attracted more than 500 engineers and their guests. This crowd applauded Mr. Eric Johnston as he reminded the engineers of their new world responsibility. He asked that America not shirk its duty as a world leader, and called upon engineers to keep alive the cause of freedom in less fortunate lands.

Toastmaster of the dinner meeting was Mr. V. E. Gunlock, prominent member of the Illinois SPE, and Commissioner of Public Works, City of Chicago. Chairman of the Arrangements Committee was Mr. George DeMent of the Illinois SPE, and member, Board of Directors, NSPE.

Prominent guests at the head table besides NSPE officials included: Engineers O. B. J. Fraser, AIMME; T. LeClair, AIEE; C. S. Proctor, ASCE and G. Egloff, AIChE.



Board of Directors and Officers of the Society as taken at Tulsa last June.

Final Plans Underway

NSPE Fall Board Meeting to be held with Annual Meeting of Virginia Society

A NUMBER of items of professional interest will be discussed at the joint meeting of the Board of Directors of NSPE and the annual meeting of the Virginia Society of Professional Engineers, to be held at the Hotel Jefferson, Richmond, Virginia, November 7 and 8. It is expected that over 100 representatives of the various state societies, committee chairmen and officers of the National Society will join the Professional Engineers of Virginia for the various functions scheduled in this two-day meeting.

A meeting of the Executive Committee of the National Society on November 6 will precede the joint meeting. All meetings during the 7th and 8th, as usual, will be open to members of the Society and other interested engineers. Leaders of the profession will be discussing not only Society programs being instituted this Fall, in a number of fields, but also will be discussing long-range plans for additional programs well into 1953.

The administrative year of the Society being from July 1 to July 1 provides this Fall Board Meeting with the opportunity for the development of many plans for the 1952-53 activities.

One of the items which will be discussed extensively will be the continuation of the public relations program and the discussion of the second executive research report on "Utilization of Engineering Manpower" scheduled for release during November. Another public relations feature will be the development of plans for the celebration of Engineers' Week in 1953, there already being indications that this celebration will exceed any previously held.

With the National election having just been reported at that time, there will be a very animated discussion on the subject of legislative activity which may be expected in the 83rd Congress. The position to be taken by NSPE on a number of items of interest to the engineering profession undoubtedly will be established at this meeting.

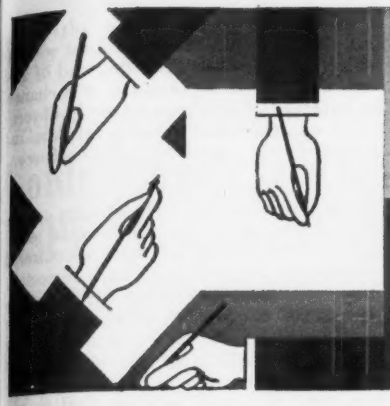
Of interest to members of the Society will be the discussion on the need for a dues increase. (See AMERICAN ENGINEER, March and September 1952.)

Other interesting discussions will center on Chapter, State and National programs to encourage the development of professional consciousness in the engineering profession; programs for acquainting qualified high school students with the opportunities in engineering; matters of National activity in the fields of civil defense, manpower utilization, conditions for employment of engineers in Government; and similar items.

The Virginia Society of Professional Engineers is planning an extensive program to intersperse with the more serious discussions on professional problems. Luncheons on Friday and Saturday, November 7 and 8, will feature two outstanding speakers dealing with the historical background of engineering work in Virginia, from the time of George Washington, and the important political aspects of recent world events.

The Annual Dinner of the Virginia Society of Professional Engineers will have as its guests the Board of Directors of NSPE and will provide an opportunity to hear from one of Virginia's outstanding legislators.

The Virginia Society is encouraging the attendance of ladies at this meeting and plans an extensive program of interest to them, featuring visits to historical areas in the proximity of Richmond, as well as an opportunity to visit some of Richmond's famous shopping centers.



Professional POSTSCRIPTS

This is your department. Your contributions to it are solicited. We want your views on subjects that affect the engineering profession directly or indirectly. Please keep your contributions short, and remember that editing may be necessary to conserve space. Your name may be omitted if you desire. — *The Editor.*

We hear a great deal about the so-called "military mind" and, with military men becoming increasingly important in our public life, it behooves us to give some thought to this interesting theory. Reader Joseph H. Roberts of Milford, Conn., thinks so too and he has sent us the following piece from the Christian Science *Monitor*. It is headed "The 'Military' Mind," and is written by John C. DeWitt.

—PP—

I am a military man. I have been for twenty-four years. I get irritated when the pundits, from the depths of their wisdom, refer to the "military mind." They would have you believe that a man who has followed the military profession for a number of years is to be set apart from his fellows; his mind is "different."

I say that's pure rubbish.

It is as sensible to infer that an engineer's mind is different, or a historian, or a businessman in an executive position, or a diplomat, or a politician, or a personnel manager, or a teacher. The military man is a combination of all of them. The higher his rank, the more likely that he will have successfully practiced in each.

The study of engineering is heavily accented at both service academies and in the ROTC courses. In the Army an officer will be confronted early in his career with problems of topography and map-making and bridge-building. He will need to know whether it's safe to send a tank across a given bridge. He will need to know a great deal of civil engineering—roads, buildings, drainage, sewerage, fresh-water systems.

In the Navy our ships and planes are a complex maze of electronic devices, communications equipment, high pressure steam turbines, evaporators, generators. There is the science of conning the ship from here to there with maximum safety. It involves a considerable acquaintance with meteorology, navigation, geography, mathematics, seamanship. Who operates the ships and planes and keeps them running?

Naval officers? Yes. But more correctly, engineers who happen to be naval officers.

All the services are involved with ballistics, the science of the motion of projectiles. In late years there has been more and more postgraduate instruction in guided missiles and atomic energy. The military man is first of all an engineer.

The most elementary study of strategy and tactics leads inevitably to the pages of history. What are the lessons to be learned from other wars? What were the political effects of military actions and vice versa? Who made blunders that cost a battle, or a war, or freedom itself? Show me a military man who is tops in his profession and I'll show you a historian.

In the last half century the years of peace have outnumbered the years of war in a ratio of better than ten to one. More and more, in peacetime the military organization must be run like any business. Congress demands it. Accountants, auditors, congressional committees are continuously burrowing into the way the military conducts its business.

An officer who has no head for business, no capacity for weighing a dollar against goods or services received can expect to fall by the wayside.

Problems of personnel are inherent in the military. Draftees and enlistees must be taught. Noncoms and petty officers must be taught. Those with most capacity to learn must be promoted as rapidly as possible. With it all comes the man who cannot stay out of trouble. Only the sluggard solves the problem by discharging the man. Personnel relations are studied in theory and in practice from the beginning of every service career. Find the exception and you have found a source of trouble which the services themselves try desperately to correct.

Within the last few years, the need for study of diplomacy and politics has never been greater. International organizations like SHAPE and SACLANT call for personnel with a thorough knowledge of other governments and races and customs.

In many organizations the representatives of state work side by side with the uniformed representatives of defense. The impact of actions and decisions on the national and international scene must be determined in advance. Whether they like it or not, high-ranking officers of all the services are practicing politicians.

What sort of mind then is the military mind? What do they do, or think, or feel that should set them apart from their fellow citizens? Listen in at their parties and you may hear a recent game of golf discussed, or maybe "The Caine Mutiny," or "The Sea Around Us." You are less apt to hear "shop talk" than with any segment of our population. For one thing the ladies object. Almost for a certainty you will hear grumbling at the high cost of living.

Is there something in the personal life of a military man that should set him apart? True, he is often away from home for periods longer than he would like to be. As a result his children may be less disciplined than the average. But what about a traveling salesman? Or a business executive with cross-country accounts? Or the construction man who works all over the world—less family?

Speaking personally, I find myself in the same groove with my neighbor on one side who is a minister and on the other who is an accountant. I mow my own lawn. In late afternoon I like to get out and prune the shrubs that need it, or pull a few weeds from around the roses. It is apparent that they enjoy the same things. There have been more fortunate duties when I had a tremendous garden. On one occasion I was even an enthusiastic raiser of chickens, proud that I could make it pay.

Is this a military mind?

I resent the term because I think it means nothing. My primary education for the military profession followed certain fundamental subjects: math, science, engineering, history. Other professions require the same studies with only slight deviations. And, when the primary education was finished, I continued to study, usually along lines the duty at the moment called for.

Most of all I studied people. How do you earn another person's loyalty? How do you hold it? How do you live with others in harmony? What are the characteristics that make people like or dislike you, listen or turn away when you have something to say, agree or disagree when you want their opinion? I submit that every executive asks himself the same questions. It would be a backward world indeed if only the military were interested in such thinking.

If we are going to refer to our population in segments, as the lawyer's mind, the doctor's mind, the preacher's mind, I can see reason for having also a military mind. But the fact that a man wears a uniform, or has stuck to his chosen profession for a long time, or is successful in his profession gives no cause to decide that he is different from any other citizen.

Next time you hear or read about the "military mind," take a closer look at your friend or neighbor who happens to be in one of the military services. Under the uniform you will find an individual with the same hopes and fears and ambitions and hobbies and way of life as your own.

There is no such thing as a military mind!

—PP—

Is better utilization the answer to the shortage of engineering talent? Here are some good thoughts on the subject by Burnham Finney of the *American Machinist* magazine. This editorial "What to Do About Engineers" appeared on the journal's editorial page.

—PP—

Industry has been loudly lamenting the shortage of engineers. And so have the national engineering societies.

In this critical situation, it seems appropriate to ask: "What is being done to see that engineers now on the job are being used to the best possible advantage?"

Someone has estimated that careless as-

signment of engineers has caused a 25% wastage of those available. With engineers at a premium, the sensible thing to do is to use them on work which really requires their technical knowledge and skill. Beyond that, they should be trained for bigger and more responsible jobs.

The industrial division of Minneapolis-Honeywell Regulator Co. is seeing that this is done. It is stretching out its engineering personnel over a larger area by freeing the men from routine tasks that non-engineers can do just as well.

Blueprinting, production scheduling and purchasing are among these tasks. Men with less technical training and clerks can perform these duties satisfactorily.

On top of that, certain work formerly assigned to engineers now is done by instrumentation. Testing and quality control are carried out automatically.

Minneapolis-Honeywell does not stop at that point. It also has a post-school educational program—the long-time training of its engineers.

This intelligent and constructive program is paying off. In fact, its success can be measured. The company's staff of engineers has expanded sharply, but the amount of engineering work being handled has increased even more. Fewer engineers are getting more work done.

In view of the dire shortage of engineers, metal working managements should do whatever they can to make the available supply go farther.

Be sure that your engineers are at work on engineering jobs. Make certain that they are not tied up on projects which could just as well be carried out by employees with less technical training. Give them helpers, for one thing, to do routine calculations.

Consider a series of well planned lecture forums for training and upgrading your engineers. Many firms mistakenly take the attitude that on-the-job experience is sufficient training and that formal classwork should end with college days.

Take the time and trouble to look into the situation in your plant. You may be surprised to discover how much more work you can get out of your engineers than you are getting now. And don't overlook the fact that the engineers themselves will love it too. They naturally like to spend their time on jobs which challenge their engineering skill and which benefit you the most.

—PP—

Our next guest this month is Carl M. Gerlach, P. E., of Solon, Ohio. Engineer Gerlach has been doing some thinking about engineering and organizations and what he says here is well worth reporting.

—PP—

Persistently, in letters and articles in engineering magazines, these three topics have come up: 1) That engineering is a most important ingredient of our modern economy and it is largely inseparable from other ingredients: a favorable government, private financing of inventive and engineering activity, productioneering, marketing, and profit expectations sufficient to encourage the risk. 2) That the public, which has the final say as to what conditions of the country are to be kept or changed, that public has but a fragmentary idea about this network of events which produces for us the highest standard of living so far known, and that the ruling class, the public, must become educated about this subject, coming to recognize engineering AND the other ingredients in the light of their true importance; and 3) Monetary rewards of engineers are too low considering the training and effort and are insufficient to encourage sufficient new blood into the field.

Topics 1) and 2) are of such importance that some leaders of industry are financially supporting the moves of educational groups in the effort to do something about the economic phases of this problem. Almost any group one could name has a stake in the outcome of these problems; actually, any group that would carry the ball in this effort could depend upon plenty of moral and financial support.

It is entirely reasonable to expect that professional engineers, through a unified organization, should endeavor to sponsor a series of professional television dramatizations of outstanding inventive engineers of the past as well as the somewhat commercialized inventive design engineers of the present. They should artfully dramatize engineering techniques, the scientific method, wherever possible to work it in, thus showing the soundness and basic infallibility of the engineering approach and thereby promoting general understanding of and confidence in this greatest tool of modern science. Such dramatizations have been presented over the air for some time, but usually to the glory of DuPont and others—to some neglect of emphasis upon methods, purposes, larger meanings, and individual participants.

Further, this Unified Society of Engineers should appreciate that, thereby, its larger purpose is to dramatize the operation of our American economy. It should show the sequence of development of technology beginning with the inventive conception of an apparatus, its engineering, testing, and development, its financing out of frugal (or otherwise) savings, its productioneering, its marketing, its sale, and liquidation of the debt which financed the venture thus making the money available to finance future technological developments.

Equally, it must be vividly demonstrated that this process is not merely a glamorous or lucrative adventure but that it is the predominant way in which we increase our standard of living, whether it be because of a chance by-product of the process or in observance of purposeful natural law ingeniously arranged by a divine force.

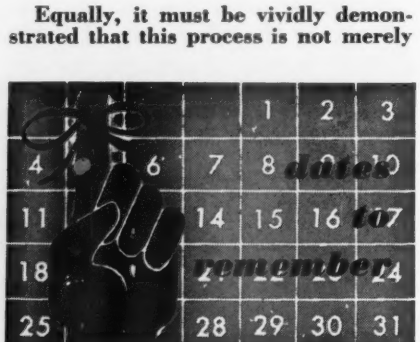
This is still not all. The obvious conclusion must be impressed: this method of advancing our technology must be nurtured, encouraged, accelerated, and respected; those who carry its biggest loads must be adequately encouraged to continue. The people of this world must become more and more economically free by use of the method that has proven its merit. Moreover, it cannot wait. We must have, as soon as possible, technological superiority over other powers who we hope will not become as belligerent as might be indicated. Technological superiority is probably the only form of superiority we might have over them. Our hope of survival depends upon the success of scientific personnel of the free world in attaining this goal. This requires a quantity and quality of people with this type of training. Presently, the adequacies of incentives to keep people in engineering, for instance, as well as to get new people into it, seems to be extensively questioned, sometimes supported by such facts as that some union crane operators draw as high as $10,000 annually.

A recognized, accepted, and forceful leadership is needed to achieve this or any other worthy program. Such leadership has not arrived yet and engineers are becoming impatient. Where can such leadership be found?

NSPE can never hope to become a completely qualified or accepted force in the role of spokesman for engineering unless it accepts as members all those who are qualified and who practice engineering registered or not. Presumably this could be done by opening up membership on an "associate" basis to those with, say, 4 years practice in an adequate capacity, and those with a degree and four years qualifying experience, even though these are not registered. It is ridiculous to assume that selected members of the engineering group (the registered) can logically or fittingly act for the whole group. Registration merely changes the legal status of an engineer; it does not necessarily denote any other difference between the registered and non-registered. Both individuals have, in most respects, the same objectives, attitudes, and complaints. A few glaring differences cannot refute that fact. Furthermore, lack of registration does not necessarily preclude being professional, except 1) legally, and 2) according to the inferences implied in the requirements for membership in NSPE. The attitude of NSPE on this point is reminiscent of the great change which "overcame" some of our young men when they were commissioned Ensign in about 1942.

However, NSPE is nevertheless otherwise most fittingly qualified by past performance to advance the objectives of the profession, whether these objectives be as to salaries, public recognition, public education, or a crusade on behalf of technology. It is already a society of some standing and membership. But it has limited its membership to minority numbers and thereby has precluded in advance its potential importance because of, what might be considered, a strange reverence of an idealistic illusion or snobbish attitude. The writer works with three other engineers with qualifications

(*Continued on page 30*)



Missouri Society of Professional Engineers—Annual Meeting, October 31 and November 1. Jefferson City.

Virginia Society of Professional Engineers — Annual Meeting, November 7, 8. Jefferson Hotel, Richmond, Virginia.

NSPE Board of Directors Meeting—November 7, 8. Jefferson Hotel, Richmond, Virginia.

North Dakota Society of Professional Engineers—Annual Meeting, November 14, 15. Minot, North Dakota.

Indiana Society of Professional Engineers—Annual Meeting, December 5, 6. Gary Hotel, Gary, Indiana.

Idaho Society of Professional Engineers—Annual Meeting, January 16, 17. Hotel Boise, Boise, Idaho.

With Our Members . . .

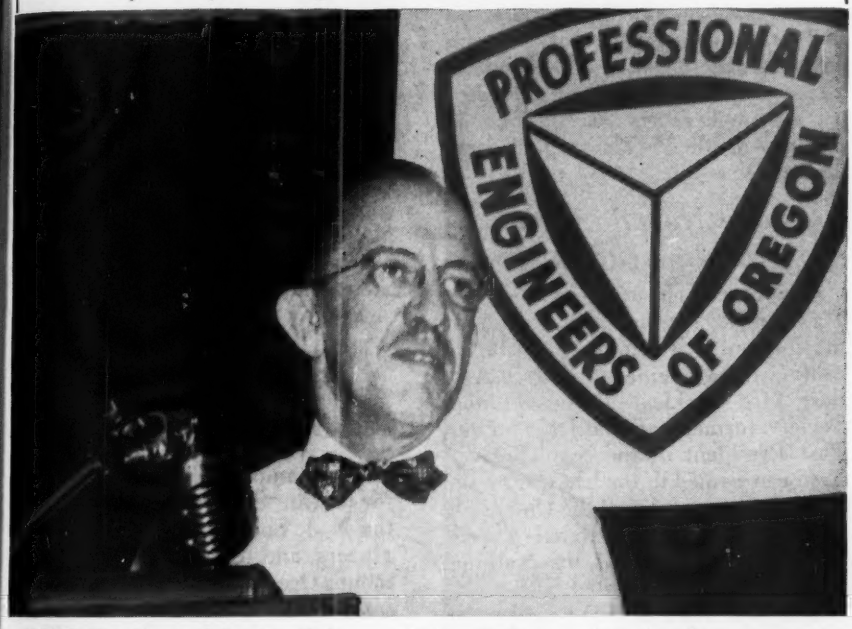
Ex-President Hoover Speaks

Golden Age Of Engineering At Hand, NSPE President Coleman Tells Convention

Several hundred professional engineers from the great Northwest area of America attended the Northwest Engineering Centennial at Portland, Oregon, recently.

Among the speakers was former President of the United States Herbert Hoover, who declared that America faces a famine of professional engineers and that

Says Engineering Has Come To "Golden Age"



NSPE President John D. Coleman declared that engineering has come to a "Golden Age" when he addressed the Northwest Engineering Centennial at Portland, Oregon, recently.

the country will suffer unless means can be found to increase our supply of engineers.

The convention was sponsored by the Professional Engineers of Oregon. President Hilbert S. Johnson of that group presided.

Among the main speakers was NSPE President John D. Coleman of Dayton, Ohio, who told the assembled delegates that engineering in America faces a golden era of progress, provided its members rise to their professional responsibilities.

"We are on the threshold of the golden age of engineering when the engineer's material contributions to our civilization are constantly reaching new heights, and at the same time we are witnessing an increasing recognition and acceptance of his vital role in lengthening and strengthening man's arm through technology and providing material comforts and conveniences never dreamed of before," Mr. Coleman said.

"As a class, however, we engineers have maintained a notoriously silent role in local, state and national affairs, even where engineering is a major factor, principally due to our failure to realize and accept our individual and collective responsibilities as citizens, as well as the absence of a community of purpose resulting from the steadily increasing compartmentation of the profession," Mr. Coleman said.

"When we had the temerity to raise our voices, like the workers on the Tower of Babel, we have figuratively spoken in many tongues, and as a result our representation has not been very effective.

"Engineers, like the other professions, need to develop a public environment as well as technology which represents the tools of the profession. This requires a united front and synchronized effort at the local, state and national level, and the coordination of a vast amount of individual effort. Thus it is seen that a single agency is needed that will be recognized as the representative and voice of the profession. Engineering's voice should speak in the following areas:

"1. *In the field of disinterested public service which an organized professional group can and should render as good citizens.*

"2. *In matters having to do with the advancement of the profession in its capacity for service and with appropriate recognition by the public of the value of such services.*

"3. *In the promotion of high standards of ethical conduct among the members of the profession and the prosecution of those who willfully violate the accepted canons of ethics or seek to misuse or misappropriate the title or function of the engineer.*

"4. *In representing the engineering profession in initiating legislation, as well as carefully following any legislation of interest to or influencing the engineer and his profession.*"

Weather Expert Tells East Bay Chapter All About Rainmaking

The East Bay Chapter of the California Society reports that Ray K. Linsley, an authority in the field of cloud seeding and rain-making, spoke to the group at a recent meeting. He described the theoretical basis of cloud seeding to augment rainfall and presented an evaluation of seeding experiments seeking to determine if seeding has been successful in promoting more rainfall.

Massachusetts Chapter Elects Ross President

Officers for the coming year 1952-1953 were elected recently in a meeting of the Massachusetts Society North Shore Chapter as follows:

President, G. A. Ross; Vice President, C. B. Fontaine; Secretary, J. W. Apperson; Treasurer, L. W. Burton; Directors, B. Minihane and K. M. Holt; Senior Past President, E. R. Gardner; Past President, J. J. Groncki; Membership Committee Chairman, H. M. Beede.

Nicholson, West Address Lehigh Valley Meeting

The Lehigh Valley Chapter of the Pennsylvania Society held a Past Presidents Night at a recent meeting in Bethlehem, Pa. PSPE President Ezra K. Nicholson addressed the group. PSPE Executive Secretary John T. West, Jr., also spoke on the provocative subject, *Our Ethics are Showing*. He is a past president of the Lehigh Valley Chapter.

Newest Thing In Communications

Georgia Chapter Sees Demonstration Of Miniature Radio-Relay System

The importance of scientific research in the development of telephone communications was dramatically demonstrated to the Augusta Chapter, Georgia Society of Professional Engineers, by Frank A. Woods of the Southern Bell Telephone & Telegraph Company recently.

Speaking on the subject "The Miracle of Radio-Relay," Mr. Woods demonstrated how hundreds of telephone calls and some television programs can be transmitted simultaneously from point to point, without the use of wires or cable, by means of high-frequency micro-wave radio-relay.

Using miniature transmitter and receiver towers, Mr. Woods showed how invisible radio microwaves carrying the human voice can be deflected, reflected and made to follow the curve of a hollow wave guide like water through a garden hose. Also how radio waves of extreme shortness are narrow-casted in relays, from horizon to horizon, rather than broadcasting them, as in the transmission of radio programs. Mr. Woods explained that these high-frequency radio signals required a line-of-sight clear channel between towers which are located approximately twenty-five to thirty-five miles apart and to prevent delay interference at some distant station the towers are arranged in a zig-zag pattern.

At each tower in the link the microwaves are collected by receiving antennas and routed through intricate radio relay amplifying equipment before being sent on to the next station. At the distant end, the individual telephone message is placed on regular wire circuits and carried to its destination, he said.

AE Wants To Publish News About Your Chapter

The American Engineer would like to carry news of what your chapter and state society are doing, but we need *your* help to do it. Is the American Engineer on the mailing list to receive notices of your chapter meetings and reports of big events your chapter promotes?

Why don't you make it a point at your next chapter meeting to find out if The American Engineer is being mailed notices of what you are doing so we can tell your fellow engineers all over America about it? Thanks.—*Editor.*

Miami Discusses Code Enforcement

The Miami Chapter of the Florida Society held a panel discussion on building code enforcement for concrete construction in South Florida at a recent meeting. George K. Headley was the moderator. Recent concrete failures in the Miami region were under discussion.

Four Nevada Members On Registration Board

Governor Charles Russell of the State of Nevada has appointed four members of NSPE to the State Board of Registered Engineers. A. J. Shaver, past Vice-President of the National Society, former National Director and Past President of the State Society, has been named to the Chairmanship. Dean of Engineering at the University of Nevada Stanley G. Palmer, a distinguished member of the National Society, was re-appointed Secretary.

The two other NSPE board members are Charles Thompson, a State Society Trustee and Harold Bishop, a past State Society Secretary.

San Jacinto Chapter Discusses Building Code

The San Jacinto Chapter of the Texas Society held a timely meeting recently at the University of Houston. The subject matter under discussion was "1952 Houston and its 1930 Building Code." Chairman Jim Stillman and members of the Chapter Building Code Committee led the discussion.

Michigan's Magazine Lauds NSPE, Supports Its Aims

P.E.N., the official publication of the Michigan Society, recently cited the efforts of the National Society in exempting Professional Engineers from salary and wage controls under the Defense Production Act. In the same issue it stressed the urgent need of P.E.'s banding together to further strengthen the enforcement of the Registration Act and advance the engineering profession.

National Director Bail Appointed To Board In New Mexico

E. B. Bail, former President (1949-50) and National Director (1950-52) of the New Mexico Society of Professional Engineers was appointed by Governor Edwin L. Mecham to the New Mexico Board of Registration for Professional Engineers and Land Surveyors.

Bail will succeed Marshall E. Farris, Dean of the College of Engineering at the University of New Mexico and a member of the Registration Board since 1944.

Governor Mecham's appointment was the result of a recommendation by N.M.S.P.E. in collaboration with the major founder societies. Bail's name was the only one proposed and submitted by the engineering groups, signifying the esteem with which he is considered by New Mexico engineers. Mr. Bail recently was appointed as Special Consultant for the New Mexico State Highway Department.

Monmouth-Ocean Group Hears About Proposed 285 Million Dollar Road

Jack Lamping, director of publicity for Ocean County, told members of the N. J. Society of Professional Engineers and Land Surveyors, Monmouth-Ocean Chapter, recently, some interesting facts about the contemplated "Garden State Parkway," at a recent dinner meeting.

While 285 million has been authorized by legislature, Mr. Lamping said, the project will appear on voting ballots, November 4, for the state's citizens to declare themselves on the construction of the parkway.

A business session was conducted by John Ernst, president, and delegates and alternates were named for the semi-annual meeting to be held at Wanamassa Gardens. They were George C. Jorgensen, Leo K. McKee, George Ritter, Benjamin Kaplan and Bruce Larrabee. Alternates included, Clarence Gale, Henry F. Labrecque and J. Charles Morgan.

Westmoreland Chapter Receives Its Charter

The Westmoreland County Chapter has come of age and has been presented with a Charter from the Pennsylvania State Society. Don C. Peters, Vice-President of the State Society spoke to the group recently in making the presentation, reports Frank G. Sciullo, Chapter Secretary.

Street Lighting Problems Discussed In Current New Mexico Engineer

The modern street lighting program in Albuquerque, New Mexico, was the major subject discussed in a recent issue of the New Mexico Professional Engineer, official publication of the Society.

The article stressed the important need of adequate street lighting in traffic engineering problems.

Norman Barnett, Assistant Traffic Engineer of Albuquerque, presented the chief arguments in the article on visability, light distribution and street lighting design in providing the necessary night visibility for safe driving. The article stressed particularly the proper design of the luminaire in providing overlaps of light from each source of light.

Mr. Barnett stressed the need to eliminate bands of contrasting brightness. In proper lighting systems every part of the roadway receives light from both directions, toward the observer and away from him so that reflected and diffused light comes to the driver from all parts of the surface.

Springfield Hears Talk On Uses Of Quartz

The Springfield District Chapter of the Ohio State Society heard the distinguished Chemistry Professor of Antioch College, Dr. Corwin, speak to the group on *Quartz in Communications* at a recent meeting. Dr. Corwin is an authority on Quartz and the Chemical Advisor for the U. S. Army Signal Corps on Quartz Research.

Detroit Hears About Construction Of United Nations Headquarters

The Detroit Chapter of the Michigan Society heralded in the new season's first meeting with a movie *Building for the Nations*. The picture is a candid, photographic record in full color of the highlights of the fabrication and erection of the structural steelwork of one of the most important buildings in the world, the Secretariat Building of the United Nations.

The film was prepared by the United States Steel Company. Carl H. Sander, Contracting Manager of American Bridge Division, U. S. Steel Co., talked to the chapter on this major "skyscraper" project in engineering history.

Plaque Presented To Sporn

Swanson Nominated For West Virginia Presidency At Group's Annual Meeting

The West Virginia Society of Professional Engineers closed its nineteenth annual convention at The Greenbrier, White Sulphur Springs, recently, with the nomination of the following officers for the year 1953:

President, O. J. Swanson, Gary; First Vice-President, George W. McAlpin, Charleston; Second Vice-President, Paul M. Hutchinson, Clarksburg; Treasurer, H. J. Wagner, Charleston.

Past-president Leslie C. Gates, Beckley, was elected as an additional director of the National Society of Professional Engineers.

The membership will vote by letter ballot on these nominations, or on other nominations which may be added by written request of the membership. Addresses by John D. Coleman, president of the National Society of Professional Engineers, and by Rear Admiral Joseph F. Jelley, chief of the Bureau of Yards and Docks, United States Navy, featured the program.

A plaque was presented to Philip Sporn, president of the American Gas and Electric Service Corporation, parent company of the Appalachian Electric Power Company, Wheeling Electric Company, and other corporations with large interests in this State, as West Virginia's outstanding engineer for 1952. Mr. Sporn, residing in New York, is a registered professional engineer in West Virginia and a member of the Charleston Chapter of the West Virginia Society of Professional Engineers, as well as holding membership in professional societies in various other states. Large developments of the corporations under Mr. Sporn's control along the Ohio above Wheeling and Point Pleasant, on the Kanawha at Cabin Creek and Glasgow, and at other points in southern West Virginia have made West Virginia one of the nation's major power centers.

At West Virginia Convention

President W. O. McCluskey, Jr., of the West Virginia Society presents Philip Sporn, President of the American Gas and Electric Service Company of New York City with a plaque honoring his contributions to engineering. The award was made at the recent convention of the West Virginia Society.

Galveston Ladies Help Meeting Turnout

The Galveston County Chapter of the Texas Society has a most active Ladies Auxiliary which it reports does a fine job of getting husbands to the Chapter meetings. At a recent social informal gathering, the ladies prepared a Smorgasbord supper for members and guests as an added incentive.

Missouri State News

Missouri Society Busy With Membership, Chapter Affairs And Other Activities

The "Show Me" state of Missouri has been especially busy recently.

The Missouri Society's Chapter Activities Committee Chairman Walter P. Rathell reports that the committee has made a study of chapter activities during the past few months.

A survey was taken and the following questions asked:

(1) What has been accomplished in your Chapter in its various activities up to this time?

(2) What is planned in the activities programs for the balance of the year?

(3) Unusual Chapter activities?

(4) What can be done to promote the best service from the Activities Committee to each Chapter and to the State Society?

The results have turned up some of the prime objectives of the state chapters which are: increased membership, better public relations and better attendance at meetings. All of the material unearthed by Mr. Rathell's committee should be of considerable interest to the entire State membership.

Membership Group Active

While this has been going on, the State Membership Committee, headed by John C. Bibbs reports that Chapter Membership Committees are now contacting every registered engineer in the state and inviting them to become members.

Chairman Bibbs is urging all Chapter membership chairmen to submit a written report to him giving the number of persons contacted, number of new members obtained and (*importantly*) reasons given by those nonmembers for not joining.

Highway Engineer Speaks

The Engineers' Club of Jefferson City endorsed the local school bond issue at a recent meeting, reports Club President D. L. Robinson. At the same meeting a talk on the Ten Year Highway Program in Missouri now getting under way was made by Chief Engineer of the State Highway Department, Rex Whitton. Mr. Whitton is a member of the club.

This club is also conducting an Engineers City Planning Study of Jefferson City. More than half the membership have accepted assignments for study and evaluation.

Brown's Prexy Speaks

The St. Louis Chapter had as a guest speaker for its first fall meeting, Mr. Bill Veeck, President, American Baseball Company, of St. Louis. He spoke to the group which included members from the neighboring state Illinois Society Chapters of St. Clair and Madison County.

Missouri Society's Annual Meeting Held Oct. 31-Nov. 1

Mayor Arthur W. Ellis, of Jefferson City, will welcome the Missouri Society when it holds its 16th Annual Meeting in Jefferson City, at the Hotel Governor on October 31 and November 1.

Leaders in education, business, public service and engineering will present discussions of the broad problems of the day as well as on the fundamental problems of the engineering profession.

Curtis Wilson, Dean of the Missouri School of Mines and Metallurgy, will be the Keynote Speaker. He will be followed by Jay William Holden, Professor of Philosophy of the University of Missouri, at a luncheon talk on *Democracy and the Man of Affairs.*

A Panel Discussion on *Recognition of Pofessional Engineer-Employees,* will be led by MSPE Vice President Dyer in the afternoon. Huber O. Croft, Dean, College of Engineering. University of Missouri, will be the Moderator.

Norman Odell Named To Defense Post

Norman S. Odell, Past President of the Westchester County Chapter of the New York Society, has been appointed as a consultant to the Deputy Director of Public Information, Westchester County Office of Civil Defense. William J. Slater, County Director of Civil Defense; there, states that he has definite need for services of P.E.'s as consultants and instructors in the civil defense program.

Life is an everlasting struggle to keep money coming in and to keep teeth and hair from coming out. . . . Sabine (Texas) Engineer.

NSPE Member Heads Chemical Engineering At Michigan State

Dr. C. Fred Gurnham, an outstanding member of NSPE, has been appointed as the new head of the Department of Chemical Engineering at Michigan State College, East Lansing. He has been the head of the chemical engineering curriculum at Tufts College for the past four years.

Dr. Gurnham is particularly interested in the treatment and disposal of industrial waste and is a member of the President's National Technical Task Committee for industrial wastes.

Postscripts

(*Continued from page* 26)

least equal to his own. Each of the three is too practical to bone up on those mostly academic phases of engineering for the sole purpose of passing the state registration exam, which also requires a two-day absence from work. After all, registration would merely entitle them to work on public projects or as a consultant, to testify in court on engineering matters, or to join NSPE, none of which except the last they intend to do. It is simply credulous to believe that a great majority of engineers will become registered and join NSPE because of incentives such as these.

Take a look at the situation—all engineers must gain experience in industry, etc., before they may become registered by requirement of the registration laws; most of these, even after becoming registered will no doubt have to remain so employed subsequently for one reason or another. Among these, there is no clear and compelling reason to become registered in the first place. Most of them will not do so. But there is a clear and practical reason for them to belong to a group whose purpose is the advancement of his profession, whether registered or not. What group can he join? *NSPE* is only for those of the profession who are registered.

It seems logical that NSPE should more properly be called NSRE—National Society of Registered Engineers—because that name is descriptive of the only group that it represents. NSPE does not represent professional engineers; it represents registered engineers. Are the differences between the two real or moot?

Why do we not take first things first, with the important separated from the specious?

Why does not NSPE go out after the membership it deserves to have instead of restricting its membership to only that proportion of professional engineers who have become registered? It would not impede a drive for full registration necessarily; conversly, it could give impetus to it.

The question of real importance is this: are we going to try to have UNITY within the engineering profession or are we going to try to have UNITY merely among the Societies. Is it going to be *NSRE, NSPE,* or CIO?

It would be gratifying to see NSPE resign itself to the nobility of uniting *all* of our colleagues and thereby attain the membership requisite to getting those things done which the whole profession ought now to be getting done.—*End.*

Above, left. Baker's firm did survey for Detroit Dam under construction in Oregon. Right. Dam in Brady's Run Park, Pennsylvania, designed and constructed by same firm.

Baker

(*Continued from page* 14)

exploit is the landing of a contract to literally rebuild the kingdom of Saudi Arabia. King Ibn Saud, wishing to modernize his country engaged Baker to design, build and operate highways, power plants, airfields, port facilities, hospitals, water and sewer systems and other facilities.

The contract, to run for a minimum of two years, provides for the construction of almost ten million dollars worth of facilities annually. Part of the Baker organization's task will be to assist in developing the mineral resources of Saudi Arabia, said to be worth many millions of dollars.

Mr. Baker recently ran ads in various newspapers and magazines appealing for engineers and technical personnel to work in Arabia on the gigantic task. He received 8,000 applicants for some 200 jobs, nearly 40 for each place.

One popular feature of the work is that salaries are all tax-free and start at a minimum of $500 per month. In addition, all expenses are paid by the company.

Michael Baker, Jr., Inc., is now one of the top engineering firms in point of volume. THE AMERICAN ENGINEER, feeling that Mr. Baker's comments on engineering and success in engineering would be of interest to members of the National Society of Professional Engineers, has submitted a series of questions to Mr. Baker on the matter. The questions, and his verbatim replies, are printed below:

Q. ***What is the present size of your firm?***

A. At present our firm employs approximately 2,525 people in all phases of our work. Of these approximately 1,900 are native Arab and Italian construction craftsmen and laborers in Saudi Arabia and 625 are engineers, supervisors and administration personnel in the United States, Alaska, and Arabia.

Q. ***What, in your opinion, is the most interesting project your firm is now working on?***

A. Without a doubt, the most interesting project on which we are now working is the Saudi Arab Development Program. Involving, as it does, the conception of projects, the planning, engineering and architectural design, procurement, construction, and in some cases, staffing the installations, the Saudi Arab Development Program is a challenge to the engineer's imagination. This is not merely project planning for carefully defined goal . . . it is planning —and achieving—all of those things which were brought about during all of these years since the Industrial Revolution. The goal of the Saudi Arab Development Program is the raising of a whole country's standard of living.

Q. ***At what age did you first decide to become an engineer? What factors influenced your decision?***

(*Continued on page* 34)

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Baker

(*Continued from page* 31)

A. My decision to study and practice engineering was not made in a moment nor at any specific age. My father was County Surveyor in Beaver County, Pennsylvania, for 50 years, the position which my brother, Daniel C. Baker, now holds. I have always been closely associated with engineering and the allied professions and have never seriously considered any other vocation.

Q. ***Do you have any particular philosophy about engineering? If so, what is it?***

A. The philosophy which guides our company is:

a. All work must be done with the highest possible degree of accuracy commensurate with the requirements of the project.

b. The employees of the Company shall faithfully serve the Company's clients, retaining in complete confidence all details of the work.

c. All work must be done to the best interest of the client regardless of the amount of compensation afforded the Company.

d. In the performance of all contracts and in all business negotiations, the Company's employees shall conduct themselves in accordance with the code of ethics for professional engineers.

Q. ***What would you say has been your moment of greatest professional triumph? Please explain.***

A. My receiving the contract for the complete design of the Penn-Lincoln Parkway-East, was probably the most important point in my career in that it involved major recognition. This four and six lane urban expressway has been acknowledged as being one of the most difficult highway design projects ever attempted in the United States. Pitting minimum rates of grade and curvature against Pittsburgh's rugged terrain, high density, and high property values called upon the highest degree of engineering skill from my staff. This 9.8 miles highway which will cost $55,000,000 upon completion, includes a 4,225 foot twin bore tunnel, over 50 structures, and five complete interchanges. The award of this contract to me involved several "firsts": This was the first time the Commonwealth of Pennsylvania had awarded a contract for engineering services; this was the largest complete project ever attempted by the State Highway Department; and this was the first time I had received a commission to design any roads larger than minor city streets.

Q. ***When was your most discouraging moment in engineering?***

A. In the operation of Michael Baker, Jr., Inc., there have been many moments which might be classified as discouraging. The loss of what seemed an important contract . . . poor progress on a project . . . and other things cause momentary dismay. My personal creed, however, is one of optimism and I found that none of these seemingly important setbacks are of importance for long. I do not believe, therefore, that I can record any moment as being "most discouraging."

Q. ***What factor do you think is most important in becoming a success in engineering?***

A. The engineering business does not differ greatly from other businesses in determining criteria for success. Those factors which must be observed are as stated in my answer above and may be summarized as honesty, accuracy, and humility: Deception and deceit have no part in professional practice. The engineer must serve his client faithfully and impartially and must decide all questions on the basis of fact determined by the application of scientific factors.

The importance of accuracy hardly needs to be stressed. It is the hallmark of the engineering profession.

Humility is a trait becoming an engineer. He may be master of his mathematics and equations but he is a servant of the people. No man can design a bridge, dam, or highway and not feel a certain pride in its accomplishment; but he must also realize that his was but one small part in the plan of the Master Designer Who made all of those things possible.

Q. ***What advice would you give to your fellow engineers who seek to emulate your success?***

A. The day has passed when high boots, khaki clothing, and rough language were the mark of the engineering trade. The engineer today is a professional man who must be able to take his place as a business leader and a community leader. The professional engineer of today must be able to speak and write intelligently and fluently to present his plans for civic improvement. In addition, a successful engineer should participate in other civic and community activities even though it means many hours of unpaid labor.—***End.***

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